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SETH LOW, LEADER OF MEN

"TO be great, you must be teachable, ready to learn, willing to take good advice, and wise enough to know where to go for the advice; then have tremendous courage, great perseverance, and that absolute self-forgetfulness that makes the followers of a great leader think not so much of the leader as of the cause."

It were hard to find words more characteristic of the personality of Seth Low than these spoken by him in eulogy of a co-worker. They put tersely what to him was essential in forwarding great undertakings. Not wealth, though he had it in abundance; not family, though he had a rich inheritance; not power, though it was often at his disposal; but the teachableness of the child, the wisdom of the sage, the zeal of the reformer, and the devotion of the disciple were his measures of leadership. The happy blending of such distinct—too often disparate—qualities made him a leader of men.

The genius of Seth Low was not that of the prophet. He assumed no esoteric wisdom, he claimed no insight denied to his fellows, he acknowledged no guidance inaccessible to others. Nor did he spend time or substance on lamentation. The world might be out of joint, but he rejoiced in the opportunity to do his part in setting it right. Situations appealed to him as problems to be solved. To grasp the problem, one must resolve it into its component factors, evaluate their relative importance, and proceed logically to the conclusion. His method of work, therefore, called for investigation, research, and the weighing of evidence; the conclusions he reached were the fruitage of intellectual honesty. Because his problems so often were problems involving human relations, and because it was his nature to deal gently with human frailties and perversities, he could honestly substantiate his conviction that nothing in human affairs is ever finally settled until settled aright. Hence his willingness to learn from any and every source whence information might come. His patience in listening to those who had nothing to offer was as amazing to his friends as it was disconcerting to his enemies; but it was a vital part of his creed to leave every avenue of information open until a decision had to be reached.

This trait, so conspicuous in Mr. Low's method of work, of wanting to know more and more of a subject, of studying his problem from every angle, was sometimes mistaken by his critics for weakness of character. Far from it. On the contrary, it was his innate intellectual honesty that compelled him to make sure of his premises, if he would have the proper conclusion. Men whose habit of mind is to project conclusions first and then array the premises to fit could have little in common with one who conformed literally to the scriptural injunction to achieve greatness by becoming a little child.

It is obvious, however, that teachableness is a virtue only to the extent that the learner knows "where to go for the advice." Nothing in Mr. Low's career showed him to better advantage than his judgment of men. He had an almost unfailing acumen in his selection of experts. Moreover, the confidence which he reposed in those whom he selected as advisers brought out the best they had to give. Whether in political life or in university circles or in industrial disputes, the acceptance of a task at his hands was equivalent to the best of service that the recipient could render. And many a worker has been surprised to find, under Mr. Low's paternal criticism, that what he thought his best could be made better still. To work under him was not only an invitation to share in his enthusiasm and partake of his spirit, but an obligation to grow in strength commensurate with the load that he imposed.

Few men of our time have undertaken more varied or more difficult tasks than fell to the lot of Mr. Low. Whether as mayor of the city, or president of the university, or arbiter in industrial conflicts, or statesman in convention, he had to face opposition entrenched in tradition and supported by privilege. His opponents were sometimes unscrupulous, frequently vindictive, always persistent. It required tremendous courage to clean up the city government of Brooklyn; it was heroic to hold down the forces of evil in New York while the foundations of a new civic order were being laid; it was no mean task to convert an aristocratic college into a great democratic university; and to some it seemed a forlorn hope to seek peace between capital and labor. But in all these enterprises Mr. Low exhibited a courage that was sublime. He never faltered, however unattainable his ideals might seem to be. If ever he was down-hearted or pessimistic, he made no confessions and showed no lack of faith. His courage was the courage of honest conviction born of painstaking research and inspired by the belief that good must finally prevail over the evil in the world. Persistence in right doing was to him a duty from which he could not escape.

The supreme quality in Mr. Low's leadership was his ability to merge himself in his cause. Self-forgetfulness is so rare a virtue as to be easily misunderstood. His willingness to reverse himself, after further reflection on the significance of new data, sometimes made him appear vacillating; but it was the nature of the man to put the ultimate good above temporary expediency. His mistakes were always of the head, never of the heart. Misplaced confidence might swerve his course, as errors of judgment might lead to wrong conclusions; but no thought of self ever entered into his consideration. Right was right, regardless of the effect on his personal welfare. Indeed, his personal welfare was identical with his ambition to do the right. So joyously did he engage in his work, so unreservedly did he give himself to it, that his example was contagious. While he secured from colleagues and subordinates an extraordinary degree of devotion, he directed that devotion more by example than by precept towards impersonal ends. His success in magnifying the cause is attested by the fact that, notwithstanding abundant opportunity, he never built up a party, a faction, or even a considerable personal following. But there is abundant testimony to the permanency of the results that he secured. One who was closely associated with him in his civic work has said that "there are none who live within the City of New York who do not share today the advantages and benefits of conditions that he helped to create." Mayor Mitchel said of Mr. Low that "he initiated public works, he effected reforms, he formulated policies, he established precedents, he fixed standards, upon which every succeeding administration has builded its progress in its effort to give to the people of New York the honest, businesslike, efficient, far-seeing, and intelligent city government which was the ideal of Seth Low." Not a word here or anywhere or at any time of his standing as a boss or party leader. Those who followed him elected his leadership because they thought not so much of the leader as of the cause which he represented. And in a democracy there is no type of leadership more enduring, none more consistent with the highest ideals of American citizenship.

Because so much of Mr. Low's life was given to his native city, and because so much of what he did is permanent, it has been claimed that he was preëminently metropolitan. It must be conceded that he loved his city, that he took pride in her history, and labored zealously for her advancement. But the charge of provincialism cannot be made against him. It was rather because he had the habit of doing well whatever he was called upon to do, and of doing the things at hand rather than dreaming of those far off, that he responded so nobly to the city's call. Moreover, to him New York was the epitome of America. He foresaw the rôle that the city government must eventually play in our national life, and he conceived it a patriotic duty to attack the enemies of American citizenship in their stronghold. If evidence were needed to prove that he had the larger view, that his aim was national rather than provincial, it could be found in his contributions to education and in his desire to solve the problems of labor and capital.

In his first annual report to the Trustees of Columbia College, after his announcement of the establishment of a University Council of advisers, Mr. Low said: "Columbia, in effect, by these recent changes, has made it clear that whatever else she may be or do, she proposes to offer to New York and to the country, hereafter, the privileges of such a university as the great city will enable her to become and be. . . . The one condition upon which Columbia may be to New York the university of the city's love and pride, is that Columbia shall show herself worthy. Her ideal must be high, her scope comprehensive, and her work substantial." Five years later he reported: "It is a cause for rejoicing that Columbia is becoming every year, more and more, a national force in the educational world. . . . In the last century, while New York was a small place, no American college contributed more or more famous men to the national life of the Colonies and the young States. . . . Thus it is again at the end of the nineteenth century. Columbia is becoming again a national force, by turning to its own use the very city whose effect upon it during the early decades of the century was to make it local, even if metropolitan, in character, rather than national."

Just as the one dominant purpose of Mr. Low's administration of the University was to create a channel through which the best that New York has to offer might flow out to the nation and the whole world, so his participation in politics and social affairs was inspired by the wider outlook. He believed that in getting good government in the metropolis, the way to better government in other cities would be opened, and that when life in cities was improved, the whole country would be benefited. He believed that if one industrial dispute could be settled by arbitration, others could be settled in the same way. And if the habit of reasoning together could be fixed in a small group, he hoped it might be applied to national and international affairs. Hence his faith in the National Civic Federation and his contribution to the Hague Tribunal. Indeed, there is something more than an accident in the corporate name of the organization to which he devoted the later years of his life, an organization designed primarily to bring together employer and employee. The terms "national" and "civic" come first. Whether Mr. Low had any part in choosing the name does not appear, but it is safe to say that an organization devoted purely to industrial ends would not have enlisted his support. But an organization designed to promote the civic betterment of the nation through trade and commerce and industry would appeal to him precisely for the same reasons that the upbuilding of Columbia University and of Tuskegee Institute appealed to him. Fundamentally, his interests were national rather than provincial, although his willingness to serve the public in any capacity, and the insistence of his friends that he should work at home, conspired to restrict his activity to the metropolitan field. Well may New York honor the man who, more than any other in his generation, served his country best by making his city better; and well may the University honor him for giving it the opportunity to shape a nation's life according to his ideals.

JAMES E. RUSSELL

THE OUTLOOK FOR DRUG CULTURE IN NORTH AMERICA

TO the well informed student of materia medica, the subject of drug cultivation presents an entirely different aspect from that which appeals to the layman interested in it as a vocation. The latter is concerned only with the profitable production and marketing of supplies. To him, scarcity of supply and fluctuation of price, natural or speculative, are of interest only as they affect his own operations. The former is interested in the profitable nature of the business only because that is essential to its maintenance. His interest in the promotion of the enterprise lies in the insurance of abundant and regular supplies at steady prices and the maintenance and improvement of quality. Obviously, the interests of each party are promoted by the promotion of those of the other, so that each is vitally interested in the experimental study of methods.

All *a priori* reasoning teaches that vegetable drugs should be products of agriculture. There was a time when man was dependent upon wild sources of supply for his vegetable foods, and this condition still obtains in regard to some articles. In the case of the latter, the disadvantages of the situation are before us, while the history of benefits conferred by the production of the others under cultivation is impressive. In it we may read the arguments in favor of subjecting drug production to a similar status. However, we are not left to such considerations for our evidence. The cultivation of medicinal plants is neither an untried experiment nor still in its experimental stage. In Europe it has been for a long time an established and important branch of agriculture. Very much has been done in Japan and in China, and much even in India. Volatile oils, which represent by far the largest money value among drug products, are mostly obtained from the products of cultivation. Those of anise, fennel, caraway, coriander, cummin, ajowan, parsley, celery, dill, angelica, lovage and other unbelliferous fruits; of lemon, bergamot, orange flowers and other citrus products; of mint, thyme, lavender, origanum and other labiates; of bay, mustard, pepper, citronella, cardamom, cinnamon, cloves, nutmegs, rose and orris; are among the most costly of vegetable products and are almost wholly derived from cultivated sources. It is true that the greater portion of most of these oils is consumed otherwise than in medicine, yet any lessons to be learned from their cultivation apply equally to their position as drugs. The same can be said of the extensive production of perfumery products in France, one of its important industries.

All opium is a product of cultivation, as is all cocaine and caffeine, and most of our rhubarb and quinine. In the case of the last named drug, we are able to look back to a time within our own recollection when the supply was threatened with total extinction, when cinchona bark sold at four or five dollars a pound and quinine at eight to twelve dollars an ounce, at wholesale. We have seen this disaster to the human race averted by the introduction of the tree to cultivation, and we have watched the price of the bark steadily decline to five or ten cents per pound and that of quinine to twenty or thirty cents an ounce. The profitable cultivation of camphor has been demonstrated, and we look for a great future development of the industry.

On the other hand, we have observed misfortune to flow from a failure to resort to this procedure in other cases. One of the most valuable drugs of the materia medica is golden seal. A quarter of a century ago there was a glut of this drug in the market. More than a million pounds of it, the insurance on which was but nine cents a pound, was burned in a warehouse in New York. To-day, owing to the destruction of the plant through excessive collection, this drug is selling at four or five dollars a pound, with the certainty of an advance to twice this price in the not distant future.

It is quite evident, therefore, that the advantages of drug production under cultivation, provided that the conditions of the individual case are appropriate, have been conclusively demonstrated, and that any experiments undertaken in this country must be regarded as looking toward an investigation of local conditions and applications, rather than toward ascertaining whether drug cultivation *per se* is profitable and desirable.

What drugs shall be cultivated? The answer is simple and unequivocal; those that can be grown with profit! Whatever considerations may be involved in this problem, all simmer down into a comparison of cost and price. So long as the total cost of supplying an article of fully acceptable quality by resorting to native sources is less than that of supplying it through cultivation, the latter method will be precluded. The idea that "manufacturers will be eager to pay a few cents more per pound" for a clean and beautiful article produced by cultivation is purely sentimental. The manufacturer will comply with the standard because he is compelled to do so, but he will do it at the lowest possible cost. There are, however, some elements of cost which are not likely to occur to the mind of the uninitiated, and which might militate against a wild product, even though it be abundant and easily collected. A large lot of a native collected drug is always the product of the labors of a great number of persons, and usually represents an extensive territory. The product will therefore be very irregular as to age of plant, season of collection, exclusion of the undesirable parts of the plant, cleanliness, perfect preservation, admixture of other plants, intentional adulteration, ignorant substitution, length of time since collection, and care in preservation, packing and marketing. Should any considerable fraction of the mixture be seriously defective in any of these ways, the entire lot is subject to condemnation; hence, to the original cost must be added that, sometimes very considerable, required to overlook, garble and clean it, after it has reached the hands of the original buyer. All this expense, of course, would be eliminated in the case of a cultivated product. Sometimes, and not infrequently, such a defect cannot be remedied; the entire lot becomes a loss and such losses must be assessed against the business as a whole. When all these factors shall have been calculated in the case of each drug, we shall find that by far the larger portion of the latter are excluded from cultivation by the item of cost alone.

Other considerations will now enter to reduce still farther our list of availables. It is probable that at least 75 per cent. of all drugs in use are consumed in such small quantity that their cultivation would not be practicable, any considerable activity in this direction being sufficient to overstock the market. A far more important consideration than any other, and probably than all others combined, is that we have not at the present time the necessary knowledge of methods to render their cultivation successful. Every inexperienced person who has tried to engage in agricultural or horticultural operations has learned how liable he is to complete or partial failure, notwithstanding that he is dealing with crops for the cultivation of which correct methods have been fully established. How, then, can he expect success with drug plants, the cultivation of very few of which has been studied? It may be accepted as a certainty that large sums of money will have to be expended and lost in failures in the cultivation of almost every drug before proper methods shall have been established. Many millions of dollars were lost in experiments in cinchona culture before success was achieved. Only a wealthy government and one with institutions that had learned the necessity for persistent effort could have been expected to bring such an undertaking to a successful conclusion. A single firm at New Brunswick, New Jersey, has already expended more than twenty thousand dollars in experiments with the cultivation of belladonna; yet satisfactory results have not yet been reached. Another firm has succeeded very well with the cultivation of this drug at Glen Olden, Pa. It may be said that all presumptions favor partial or complete failure in the cultivation of a drug when it is first undertaken, and we are justified in accepting this as a general fact. It will then readily be seen that this is no business in which a novice should invest his fortune, or to which he should turn for a living in the absence of other means of support. We may go still further and say that it is hardly a suitable subject of experiment, except on a restricted scale, for a private individual under ordinary circumstances. It is distinctly pioneer work, and should be undertaken either by people of means and leisure, or by federal or state governments, public gardens, experiment stations, or other institutions which represent combined effort.

In the United States, a great deal has been done by the Federal Bureau of Plant Industry, by which successful methods have been established for the cultivation of some very important articles. Several manufacturing drug houses have done and are doing much, most of them experimenting with only a few drugs. In California, Dr. Albert Schneider has experimented successfully in the production of belladonna. What is needed is a more general and more systematic effort, covering a wide variety of climate and soil. Experiment has shown that most drug plants are peculiarly sensitive to even slight variations in the character of the soil, as well as of plant food supplied in the form of fertilizer. In all parts of the country should be located drug experiment stations, maintained by funds appropriated for this special purpose, and not dependent upon the results of the experiments. Such an arrangement would determine the most suitable soil and climate for each drug and the best methods for its cultivation. Only after this has been done and the results published, will private individuals be justified in hoping for profit from their individual operations.

The necessity for such experimental work is being demonstrated at present as it never has been before and probably never will be again. The present conditions in Europe have not only resulted in enormously reducing our supplies of many drugs and completely eliminating some, but at the same time have caused a very great increase in the demand. There has been a steadily increasing scarcity since the commencement of the war. This has now reached the point of partial famine, and the indications are that it will be subject to a far greater increase before relief arrives. There has been ample time since the commencement of the war for the production of these drugs in this country to have made substantial progress, had the necessary information regarding their cultivation been available. Now when the immediate and pressing necessity for supplies is experienced, we are only beginning the necessary experimental work.

All that has been said thus far in this article relates merely to the furnishing of supplies. A far more important function of experimental work relates to the improvement of the quality of drugs. Art has abundantly demonstrated its ability to improve on nature in almost all cases, and the production of drugs is no exception to this rule. To refer again to some of the important drugs named in the beginning, it may be pointed out that the coca plant, probably the most ancient of cultivated drugs, is, in its present state, the result of improvement under cultivation. Although the native progenitor of the cultivated plant is not known with certainty, yet it has been definitely established that in case of escape from cultivation, when left to natural conditions, the coca plant rapidly deteriorates into a condition in which it is quite worthless for the purposes for which its leaf is used. The result in this case is quite as marked as in that of our staple food plants. The opium poppy of Turkey is a very refined product of centuries of improvement under cultivation. The quality of tea and coffee, as well as of guarana, another caffeine yielder, is well known to be the result of long cultivation. The finest of Chinese rhubarb is produced only where the soil and climate are most favorable and when cultivation is most thorough. Our original supplies of cinchona bark rarely yielded over two per cent. of quinine; and the highest yield that was ever habitually secured from the best of the wild barks ranged between four and five per cent. of total alkaloid. Now from six to seven per cent. of quinine is expected in the best plantations; and as high as twelve and even fifteen per cent. has been secured in exceptional cases. The methods employed in the accomplishment of this result have been more varied and have been carried farther than in the case of any other drug, and they have included almost all that are known to scientific agriculture. The selection of trees for breeding purposes has been carefully carried out. Wide variations in the yield of quinine have frequently been observed among individual trees of the same species and variety growing together, and material improvements have been secured by the use of seeds collected from the better trees. This fact has been demonstrated not only in India and Java, but also in Bolivia, where the most valuable trees are native. In this same region, both in the plantations and in the forests, I have observed the widest variations due to hybridization. The flowers of this tree are of tubular form and manifest not only dimorphism but even trimorphism, a condition which is most favorable to hybridization, and which, in this case, becomes effective through a double set of forces. These flowers are specially subject to the visits of small insects, a condition which would in itself be certain to result in hybridization. These insects, in turn, are sought by myriads of humming birds, which render the plantations musical during the flowering season. Thrusting their beaks into the sticky corolla-tubes, they freely transport the pollen from tree to tree. I have frequently shot these little birds to find their bills, not merely smeared, but actually "balled" with masses of pollen. Under such circumstances, hybridization upon an extensive scale would be inevitable, and this result is fully apparent, in fact most conspicuous, among the trees. As a result of such hybridization, there is usually a degradation of quality, since worthless species enter into the parentage of the stocks. This, however, is not always true. Variations in an upward direction are not infrequent, and the greater part of our present supply of bark is produced by hybrid forms.

Some other highly interesting results observed in the case of cinchona have not been utilized up to the present in application to other plants. Through a variety of occurrences, mostly accidental, it was learned that the percentage of quinine in the bark became greater under the influence of shade. To so great an extent was this true that the bark upon the north side of a tree would yield an appreciably larger percentage than that upon the south side. Bark which was heavily covered with lichen growth would be found richer in alkaloid. This information was utilized by covering the trunks, originally with moss, later with straw, paper, or any other substance that would afford shade, with the result that a far larger yield of quinine was secured. It was also discovered that new or scar bark, that covering a portion of the trunk that had previously been stripped, would be very much richer in alkaloid than the original bark. This led to the custom of removing a part of the bark in the form of vertical strips, and then allowing these denuded portions to become again covered, this process for securing a bark of superior richness being known as "renewing."

To how great an extent these operations might be applied to other drug-yielding plants is, of course, not known; but certainly they point the way to needed experimentation. Doubtless there are many other processes still unthought of which may be advantageously applied to many of our staple drugs. From every point of view it appears certain that methods may be found for the introduction of great improvements in the quality of our drugs under cultivation, quite aside from those which result merely from better control of purity, cleanliness, proper collection and preservation of the product.

In summing up, it may be said that there is already considerable need for drug cultivation in the United States and that this necessity will steadily increase, both as to the drugs now affected and as to the extension of the list; that in the case of a fair number of drugs the procedure may now be conducted with profit, and that, as the result of proper experiment, this possibility of profit may be greatly increased; that there is a crying demand for extensive experimentation, especially in the line of improvement of product, and that such experiment should be conducted by public institutions; finally, that most of the private individuals who are disposed to enter upon the cultivation of drugs for profit would act unwisely in so doing, and that the duty of those in authority is rather to discourage than to encourage such operations, as a general rule.

It is very unfortunate, and can hardly be regarded as otherwise than discreditable, that no provision for such work should have been made at New York, a city where at least seventy-five per cent. of the crude drug supply of this country is handled. A well planned movement is now under way to establish such an experiment station upon the grounds of the New York Botanical Garden, to be conducted by the New York College of Pharmacy. By this arrangement, all overhead charges are avoided, the expense being restricted to the bare cost of labor and materials. It is estimated that the small sum of $20,000 would be ample for the permanent endowment of such an institution.

H. H. Rusby

LITERATURE AND LIBERALISM[1]

IN his presidential address to the American Historical Association in December, 1913, Professor William A. Dunning discussed with his wonted sagacity, moderation, and persuasive humor a certain characteristic of historical research during the last hundred years. He pointed out that during this period students of history had been chiefly concerned with the discovery of the things which had actually happened rather than with the causal nexus between these occurrences. "The absorbing and relentless pursuit of the objective fact" had thus become "the typical function of the modern devotee of history." In a most interesting and illuminating way Professor Dunning went on to point out that "the course of human history is determined no more by what is true than by what men believe to be true"; that "the phenomena of social life, so far as they are determined at all by the will of man, are due in origin and sequence to conditions as they appear to contemporaries, not to conditions as revealed in their reality to the historian centuries later"; and that, therefore, "we must recognize frankly that whatever a given age or people believes to be true, *is* true for that age and that people." It follows, then, that in the attempt to understand the course of events in their relations of cause and effect it is repeatedly the error and not the fact that is important.

In the presentation of this idea Professor Dunning drew some instances from the influence of Roman history in shaping the development of Europe, from the history of the Jewish nation as a factor in the life of Christendom, from the contribution made by the long credited relation between trial by jury and Magna Carta to the maintenance of constitutional government. His address was delivered before the outbreak of the present war. To any one who is reasonably conversant with the enormous mass of apologetics which this war has called forth there can be, I think, no doubt that in any subsequent historical study of the causes of the conflict what the different governments and peoples believed to be true will be found to be far more relevant to an explanation of its origin than what really was true. Nor do I have any doubt that, if one considers with an open mind the records of universal history, he can not escape the conclusion that the objective facts will but rarely be found adequate to account for their supposed effects. In other words, mankind always has clothed and always will clothe its perceptions of objective facts with its own feelings and beliefs, will always view these facts in the colors of its own predilections and prejudices, will in short seldom, if indeed ever except in rare individual instances, see these facts as they really are. Caesar, with characteristic insight into the infirmities of human nature, notes as one of the reasons for a decision of the Gauls *quod fere libenter homines id quod volunt credunt.* And with reference to a wider sweep of thought, James Martineau in the preface to his fascinating book on *Types of Ethical Theory* acutely says: "Intellectual pride and self-ignorance alone can blind us to the fact that systems of philosophical opinion grow from the mind's instinctive effort to unify by sufficient reason and justify by intelligible pleas its deepest affections and admirations." I wish, then, to draw at this point a conclusion of vital import to my subsequent argument, that all students of the activities of mankind, all those, in other words, who endeavor on any basis that is rational to deal with men as members of a social organism, must frankly admit that these activities and the ideas out of which they spring will not always, and probably will not even commonly, bear such a relation to the objective facts with which the ideas are concerned as to be predictable upon any knowledge of these facts alone. Such predictability, if there be any at all, must rest, in large measure, upon a study of human psychology in its weakness and capacity to misunderstand. And even so, there is multifarious evidence, supplied by the life of to-day no less than by the records of the past, that the vagaries of the human mind, or rather, perhaps, of the human heart, will constantly confound the purely rational observer. Even a dullard must observe that other people feel and reason differently both from himself and from one another in regard to the same things. But how few are so self-disciplined, how few have so far outgrown the self-confidence of the nursery, as to be led by their amusement at the obvious irrationality of their neighbors' views to ask themselves from the standpoint of an ideal observer whether their own views are not probably equally at variance with the same objective facts.

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[1] Amplified from a paper read at the Tenth Annual Meeting of the Classical Association of the Atlantic States at Philadelphia, April 14, 1916.

. . . . Quid rides? Mutato nomine de te
Fabula narratur.

In every life the principle of the personal equation is operative; in this respect each of us is necessarily *unus e multis*. As Catullus, in a rare philosophical mood, aptly says:

Nimirum idem omnes fallimur, neque est quisquam
Quem non in aliqua re videre Suffenum
Possis. Suus cuique attributus est error,
Sed non videmus manticae quod in tergo est.

But the endeavor to comprehend in others and in ourselves also this *Suffenitas,* if you will permit me the word, is obligatory; for if we fail of this comprehension, we shall be unable to account for the sequence of events. Like Kenyon and Donatello in the story of *The Marble Faun,* we shall be unable, because we stand outside the church, to appreciate how those within the edifice are moved by the radiance of the colors in the windows. Insularity can unfortunately coexist with great learning and even with great genius. Many persons of this distinguished class thoroughly enjoy what Daniel Deronda so dreaded, "that dead anatomy of culture which turns the universe into a mere ceaseless answer to queries, and knows, not everything, but everything else about everything—as if one should be ignorant of nothing concerning the scent of violets except the scent itself for which one had no nostril."

Primroses by the river's brim,
Dicotyledons were to him,
And they were nothing more.

The group or class consciousness puts into fixed forms the standards of judgment and thus erects between man and man invisible but almost impassable barriers. François Villon in search of a lodging for the night has with the Seigneur de Brisetout that wonderful conversation into which Stevenson has put all the pathos of a mutual incapacity to understand. But I need not enlarge further upon this point in either of its two aspects. The evidence is as the sands of the seashore for number. The elusiveness of the objective facts and the inability of those who in different and often contradictory ways are equally astray in their conception of these facts to understand one another's language have been in the past among the chief causes of the tragedy of human life. What of the future?

Never, I suppose, has there been a time in the history of the world when received opinions, however strongly supported by long tradition, have been more called in question. In every field of thought and investigation critical scholarship is examining anew the bases of orthodoxy. The results of this destructive criticism are already so striking that some of the ablest minds, ambitious of an entire reconstruction of the world in terms of real social justice, have gone so far as to regard the spirit of conservatism as in itself the most serious enemy of progress. But whatever might have been the outcome of these critical processes under more normal conditions, the great war has thrown a most lurid light upon our supposed advance in civilization and has raised the gravest doubts as to the security of our position as heirs of the ages. As Lord Bryce has said recently: "Sometimes one feels as if modern states were growing too huge for the men to whom their fortunes are committed. Mankind increases in volume, in accumulated knowledge, and in a comprehension of the forces of nature; but the intellects of individual men do not grow. The disproportion between the individual ruling men with their personal prejudices and proclivities, their selfish interests and their vanities, and the immeasurable consequences which follow their individual volitions becomes more striking and more tragic." The long struggle for freedom of thought, so finely portrayed in Professor J. B. Bury's recent book, and for that freedom of action through which alone freedom of thought can be other than an academic idea, may after all end in disaster. It would seem to be an appropriate time to ask again what ends education may serve and what elements may have most significance for the happiness of the race.

On the basis of the evidence afforded by not a few articles and books there are still in the world those who believe in war as a necessary element in man's spiritual growth. I have observed that no one of these thinkers has ever discussed what will happen if a single world-state or at least an amicable league of two or three huge states shall presently be evolved. As such conditions would on the basis of their own arguments insure peace, the human race would then, I suppose, begin to retrograde in civilization. However this may be, the thoughts of the world as a whole are now much concerned with the possibility of establishing some permanent basis of peace at the end of the present war. How may such a permanent basis be secured?

Let me call your attention at the outset to a few elementary considerations. You cannot by legislation make men good; you can at the best provide in this way a favorable environment. No law can be really enforced which does not have back of it the support of the community. Mankind is usually clever enough to find ways of evading a law in which it does not believe, and it will in case of necessity decline altogether to obey the law. It is a matter of common observation that, if the penalties imposed by a law are too severe, juries will not convict. If, then, we are to have peace in the years to come, if the widely differing ideas and ideals of individuals and nations are to have their fate determined by their own inherent vitality and not by external superior force, *an attitude of mind* must be produced which is friendly to such liberty of growth, and hostile to limitation of the life of ideas by the power and authority of stronger individuals or stronger national organizations. To produce such an attitude of mind among all men is a cardinal function of education. To increase the number of those who think and feel rationally and who are quite unwilling

To prove their doctrine orthodox
By Apostolic blows and knocks

must be one of the most important, if not, perhaps, in any large way of considering the world's needs, the most important of the results which any curriculum of study, any scheme of education, must produce. I say *must;* for it is evident that with the increasing mastery of man over the secrets of nature explosives and engines for their use may easily be discovered in the future which will make the instruments of destruction of the next great war as much more deadly than those of today as those of today are deadly in comparison with the weapons of 1870. In such a case the picture drawn by Mr. H. G. Wells in *The World Set Free* might actually be realized.

What, then, if one considers the subject in the broadest possible way, are the several educational factors which may bring about such an attitude of mind? I shall attempt no invidious distinctions between the several branches of knowledge. Each has its honorable function. But there are three groups of studies which in definitely larger measure than the rest seem likely to foster this liberal spirit of which we have been speaking. These three groups are (1) mathematics and the natural sciences; (2) the social sciences; (3) literature, philosophy, and history. I am fully aware that the modern historian views with distrust any association of history with literature, but for our present purpose the old kinship still holds. In effect, even if not with conscious intention, history, like philosophy, is concerned with the same end as literature. Let me at once define this end to be the interpretation of man to himself in such a moving and broadening fashion that his conception of the possibilities of his nature, of its many-sided capacity for new growth and new achievement, will make it difficult for him to be satisfied with a provincial outlook on this subject, or to rest content within fixed boundaries. The justice of this definition may well be called in question by one who considers only a single work, a single author, or even a single literary movement. But I am thinking rather of literature in its totality and of the determination of its inherent tendency from the evidence furnished by a comprehensive survey.

In every problem of education two elements are necessarily to be considered, man himself and his environment. This environment, in turn, is twofold: in part physical, subject to laws that are absolutely beyond his control; in part social, operating in any given form of society no less in conformity with law, but wearing a specious aspect of pliability. For as the laws of the social organism derive ultimately from the laws of his own nature and he seems to be a free agent, it is difficult to discover a necessary sequence of cause and effect. I yield to no one in my admiration for mathematics and the natural sciences. All the branches of knowledge in this first of our three groups involve the revelation of a majestic order in which there is no caprice neither shadow of turning; and so into the study of these branches—which alone seem to me to be in the strictest sense of the word true sciences—there has gone all of man's passionate longing for an invariant, eternal beauty of orderly structure in a world of which mutation and transitoriness seem to be the characteristic notes. Πάντα ῥεῖ, as Heraclitus said. And men have sought for an escape from that truth into one transcending it. As Professor C. J. Keyser has finely expressed it in an address on *The Human Significance of Mathematics,* "Man contemplated as a spiritual being, as a thinker, poet, dreamer, as a lover of knowledge and beauty and wisdom and the joy of harmony and life, responding to the lure of an ideal destiny, troubled by the mysteries of a baffling world, conscious subject of tragedy, yearns for stable reality, for infinite freedom, for perpetuity and a thousand perfections of life." I yield delighted assent to the eulogy pronounced in this address on mathematics, and, by implication and in many cases by direct statement, on the natural sciences as well; but just because this eulogy is true in the terms which I have quoted, science including mathematics cannot be our chief aid in solving the particular problem which I have stated to you. This ordered universe of law in which cause produces effect in unbroken sequence represents to man a world into which he is slowly, as the centuries and millennia pass, educating himself, which ever beckons him onward, which affords to him in the midst of his feverish life a refreshing refuge, from which after a brief sojourn he may come back strengthened to face the almost insoluble problems of his daily existence. But these distressing problems which arise from the fact of his relations with his fellow-men cannot be solved successfully by the temper of mind which is nourished by thoughts of invariance. It is the vagaries of human nature that are the causes of the difficulties; and every attempt to deal with human nature as if it were or could be static or amenable except under duress to such control as is essential in military discipline will certainly in the end fail wholly.

It is indeed the distinguishing peculiarity of man that, product of his physical environment as he appears to be, he is nevertheless its superior and its judge. It is not from this environment that he draws his standards of perfection, but rather from the aspirations of his own nature.

> Laboriously tracing what must be
> And what may yet be better—

he has always had visions of a world that would be 'nearer to the heart's desire.' He has in fact, as in the poetry of Shelley, given bodily form to such an ideal world, and pictured to himself how much more nobly life might there be ordered; and he must continue to be animated by this divine dissatisfaction under penalty of ceasing to be man and becoming simply an unreflecting part in the mechanism of the world-machine. For this beautiful cosmic order, this passionless all-pervasive law, is essentially ruthless, and shows in its workings no kinship whatever with that moral sense for justice which is implicit in all human civilization. Nature, always 'careless of the single life,' is not always even 'careful of the type,' at least in the form which mankind regards as the noblest. And it is mankind, not Nature, that is the judge. As John Stuart Mill pointed out in his essay on *Nature,* "The only admissible moral theory of Creation is that the Principle of Good cannot at once and altogether subdue the powers of evil, either physical or moral; could not place mankind in a world free from the necessity of an incessant struggle with the maleficent powers or always make them victorious in that struggle; but could and did make them capable of carrying on the fight with vigour and with progressively increasing success." The study of the natural sciences is, then, indispensable. For they acquaint us with the conditions under which we are to fight, make clear the odds against us, and enable us to determine in what ways alone we may presently be victorious. But the object of the struggle is to make man the *master* of the forces of nature. Success is dependent upon exact knowledge, not easily or quickly to be acquired, of the sequences of cause and effect that obtain in nature's operations, sequences that are not only invariant but, *considered in themselves,* wholly amoral. It does not, therefore, seem reasonable that preoccupation with phenomena of this particular kind should fit one to be peculiarly helpful in the solution of problems which have their origin in the real or apparent clash of interests of fundamentally variable and moral beings.

One further fact is worthy of note. To the minds of scientists who are entirely great nothing can be called finally a scientific fact until, after it has been minutely investigated, verified, tested and retested, it still yields always the same result. It thus attains the crowning hall-mark of science, *i. e.,* impersonality and universal validity for mind *qua* mind. The true scientific temper is thus markedly cautious, and its possessor has no peculiar confidence in the final truth of his own personal theories. No one can read the *Life and Letters of Charles Darwin* without feeling the essential simplicity and modesty of his nature and the delicacy and winning power of his scientific doubt. But in minds of smaller calibre it must, I think, be admitted that scientific studies tend rather to foster than to moderate that confidence in the final validity of one's own judgments which is the besetting infirmity of so many earnest and ambitious workers in every field of human activity. The imperious —and in itself wholly admirable—desire to be able to describe the facts of experience in terms of invariable sequences cannot well without strong reluctance admit the existence of definite limitations to its satisfaction. When one considers, for example, the brilliant discoveries of physico-chemical analysis, and the certain dependence of the life of organisms upon physical and chemical processes, it does not, perhaps, seem strange that the mechanistic explanation of the human mind has been by some scientists so confidently upheld. Yet it is increasingly clear, as Dr. J. S. Haldane has recently pointed out in his *Mechanism, Life and Personality,* that this conception has never been anything but 'a working hypothesis of limited useful application.' If, as many of us are still fain to believe, there is in man an incalculable element, if he is in reality forever rediscovering himself in terms of new experience, then no formulae of any kind involving invariable sequence will ever be adequate to describe his life, and there is need of the greatest caution lest science, to which he owes the priceless gift of liberation from superstition, may yet, at least for a season, persuade him that he is a link in a chain of material forces.

If mathematics and the natural sciences, invaluable as they are, will not provide for us precisely the help that we need, what shall we say of the social sciences? Just at this time these branches of knowledge stand in high favor. They are evidently mighty helpers in all noble endeavor to achieve a betterment of human life and of the conditions under which it is lived. They draw to their pursuit an increasingly large number of the most alert, ambitious, and high-minded of our students. Yet I cannot help thinking that these studies also leave something to be desired. The phenomena with which they deal have always been difficult to analyze. In our modern states with their huge populations, with political, industrial, and social organization of a bewildering complexity, it is extremely hard to distinguish the essential from the accidental and to arrive at a solution of a perplexing problem upon a basis that involves a permanent gain in comprehension of the issues involved. These sciences are perhaps as yet too young. Their results have not as yet been adequately expressed in forms of art. But their availability for the purposes of our present inquiry is certainly gravely impaired by their inherently administrative character. Concerned as they are with the quest for principles which will make it possible to organize human beings in the mass, and fully aware of the advantage to the individual of the collective activity of the community, these sciences tend to develop somewhat unduly belief in the efficacy of organization as such, and in their fine enthusiasm for the general gain tend to overlook the special claims of the individual. We have thus still to seek a corrective influence.

In the sense in which I am using the word in this inquiry literature is to be conceived, as I have already stated, as one of the means whereby man is made aware of the possibilities of his own nature and of that of his fellow-men. Like all the fine arts, literature provides us with noble pleasure; but it finds its chief function as a criticism and interpretation of life. Its content, therefore, is the supremely important element. I am not forgetful of the doctrine of literary *genres* and of the historical evolution of these *genres* as part of the technic of the fine arts. But with reference to the function of literature of which I am speaking I should like to define style in a somewhat different way. The object of language is to convey thought and feeling from one mind to another without loss of moving power. Style, as it seems to me, is that form into which one may cast his conception with reasonable confidence that because of this form his conception will be able to operate without friction, *i. e.*, without loss of power. If in mechanics force be applied in an improper way, either the work will not be done at all, or, if done, will be accomplished only with a great waste of energy. If the style is adequate, the idea will have free play, and will even gain in power to move. But the supremely important thing is the human life itself that is thus adequately expressed. Of this portrayal the style is an inseparable part and not, as it were, a garment which may be donned or doffed. It can scarcely be a matter of doubt that if one studies literature in this way as the sublimated essence of the life of mankind, not ancient or medieval or modern literature, much less the literatures of separate countries, as, for example, Greece, Rome, France, Germany, England, Italy, America, if one studies rather world-literature or any given section of the whole *as a section of the whole,* one will gain a very lively sense of the essential similarity of the problems that man has attempted to solve, of the very great difference of the solutions which have been advanced, and of the extraordinary diversity of small differences of detail which make each new form of the problem really after all a different problem. To put my meaning more clearly, the student of literature will find in its masterpieces, as he will not find in any of the natural sciences or in any of the social sciences, the imaginative portrayal of the inner life of man himself in connection with the problems that eternally imperil his happiness, and if such a student read with an open mind, he will presently become convinced that there has been no final solution because no final solution is possible. For it is the spiritual life of the race that is thus presented to his eyes, the concentration into a few score years of reading and reflection of the experience that might be gained by centuries of travel and intimate sympathetic companionship with myriad diverse types of self-expression, all described in forms of art by writers who themselves loved and understood the life they pictured. It would seem that no provincialism of outlook, no narrowness of social or political creed, no confidence in the absolute truth of one's own views, could fail in the end to succumb to such a many-sided intimacy with one's fellow-beings. George Eliot says of the parting of Romola and Savonarola: "The two faces were lit up, each with an opposite emotion, each with an opposite certitude." To agree with both is not necessary, nor indeed possible; but to understand both is indispensable, unless one is determined to stretch life forever upon a Procrustean bed. For such clashes have everywhere and always arisen, and there can be no reasonable doubt that in the future as in the past human beings equally competent, equally sincere, equally high-minded will answer the same question not only in different ways but even in antagonistic ways. For the clash of feeling and resultant action may arise from irreconcilable conceptions of the whole purpose of human life and of the part that it plays in the universe. How diverse are the worlds of Lucretius, Dante, and Goethe! Philosophies have come, have gone, and have been succeeded by others. Yet we are today no nearer a final solution of the mystery. Codes of ethics have met and are still today meeting with the same fate. The world still divides sharply as it has always done; and even where the old phrases are still employed, each new age reinterprets them to suit its own larger experience. Who shall decide these questions? Time possibly, but certainly no single age and still more certainly no single man, *e. g.,* the reader of the tale at any given moment. Historical research has brilliantly shown that men and opinions may be for generations treated in a manner far above or far below their deserts. The judgment of contemporaries does not necessarily prove anything. Centuries may pass before justice is done and—justice may never be done.

What then is the lesson of literature for those who would fain have peace in the world in the years to come? It is essentially the same as the creed of liberalism; and liberalism, we may note, is quite different from tolerance. As Mr. L. T. Hobhouse expresses it in *Liberalism:* "The Liberal does not meet opinions which he conceives to be false with toleration, as though they did not matter. He meets them with justice and exacts for them a fair hearing as though they mattered just as much as his own. He is always ready to put his own convictions to the proof, not because he doubts them, but because he believes in them. For, both as to that which he holds for true and as to that which he holds for false, he believes that one final test applies. Let error have free play, and one of two things will happen. Either as it develops, as its implications and consequences become clear, some elements of truth will appear within it. They will separate themselves out; they will go to enrich the stock of human ideas; they will add something to the truth which he himself mistakenly took as final; they will serve to explain the root of the error; for error itself is generally a truth misconceived, and it is only when it is explained that it is finally and satisfactorily confuted. Or, in the alternative, no element of truth will appear. In that case the more fully the error is understood, the more patiently it is followed up in all the windings of its implications and consequences, the more thoroughly will it refute itself." In the long run, unless we are willing to look forward to a future of intermittent warfare, the intercourse of men must be made to rest upon the basis of liberalism. Beyond question situations will arise which will involve very nice decisions, decisions about which there may be considerable difference of opinion even among liberals; but here as in natural science experimentation will teach. Within reasonable limits of safety to the body-politic and body-social the widest and most varied laboratory work is desirable. However learned I may be, however expert in my field, I am not omniscient, nor can I possibly pronounce, as time perhaps will pronounce, upon the merit of a proposal in which I do not myself believe. Paradoxical as it may seem, if I am a sincere seeker for truth, I shall help my antagonist to put his case in the most favorable light and coöperate with him in securing an opportunity for putting his theory to the test. I shall do this because I am convinced that his theory will not work, and that the sooner it is demonstrated that it will not work, under conditions which he himself chooses as being especially favorable for success, the better for my own position.

At what, then, should we teachers of the classics aim, first, at all hazards, for ourselves, secondly, in such measure as may be possible, for our students. To put the answer briefly, the great authors —I beg you to note the adjective—the great authors, who because they possess the divining faculty of genius have something to say of permanent value on the philosophy and problems of human life, these great authors should be our intimate friends, known as such, as real personalities. There is a solidarity of mankind which transcends time and space. Despite all the difference between the ancient and the modern world, Plato speaks to us today no less intelligibly and with no less compelling power than John Stuart Mill, Vergil with no less power to make us feel the mystery of life than Wordsworth. Of this be sure: we may be able to translate our author, Lucretius for instance, with absolute correctness from cover to cover; we may have at our fingers' ends the whole history of his text, his sources, his peculiarities of diction and syntax. But if this knowledge be, so to speak, dicotyledonous, if we do not understand and appreciate in terms of life the meaning of these facts, as an expression of the pathos of human life and the saving power of reason by an extraordinarily noble and virile personality, then we shall miss the finest part of the gift of literature. Others, but not we, shall know Lucretius as a thoughtful friend, shall widen the circle by including in it the other shining names of Greece and Rome and their great successors in the centuries that since have passed, and shall by daily intercourse with so many-sided a company come into that largeness of vision and wide sympathy which is real wisdom. And of wisdom it is still true, as it was in the days of Solomon, that "her ways are ways of pleasantness and all her paths are peace."

Iustitia est constans et perpetua voluntas ius suum cuique tribuens. The conception of justice thus expressed in the opening words of the *Institutes* of Justinian has gained ground but slowly, as one may see, for example, by considering the four thousand years of human activity that have elapsed since the promulgation of the enlightened Code of Hammurapi. But, granted the presence of the *voluntas,* actively *constans et perpetua,* there yet remains the all-important question, by whom the *ius cuiusque* shall be defined, by the giver or by the receiver. From this root have sprung those countless conflicts in which with the noblest intentions men have granted, or rather imposed, a *ius* which the recipients passionately rejected. Always there has been too much at work that naive understanding of the Golden Rule which leads A. scrupulously to give to B. (whose ideals are quite different from A.'s) what A. himself would desire to receive if he (still unchangeably A.) were in B.'s situation. *Voilà la comédie humaine—tragique!* For B., having achieved his *ius* as he himself defines it, proceeds then to deal with C. (who agrees with neither A. nor B.) in precisely the same spirit in which A. has dealt with him. Few, indeed, have been the successful rebels against constraint who have not in turn been eager to constrain. But literature, which is the mirror of life and therefore of man's infinite variety, will yet with the help of philosophy and history—for the help of these two disciplines is indispensable for the full comprehension of the portrayal—make it clear to every open mind that the individual does not and can not acquiesce in another's definition of his *ius,* and that in the future control must be exercised rather over the conditions amid which he develops his personality than over this development itself. For personality can no more be permanently enchained than could Proteus of old.

NELSON GLENN McCREA

CELTIC STUDIES IN THE UNITED STATES

I. The Productivity of Celtic Studies

THE mistake has often been made of confusing the efforts of scholars to gain a broader understanding of the rich and vigorous literature of the ancient Celts with, on the one hand, the so-called neo-Celtic movement consisting of a more or less artificial revival in modern literature of vague Celtic traits, and, on the other, the laudable efforts of enthusiasts, who have unfortunately been suspected of political motives, to prevent the Irish language from falling into a state of total desuetude. Though it is true that the productions of poets of the neo-Celtic school have aroused a certain interest among readers in the contemporary literature of Ireland, it cannot be said that they have directed attention in any significant way to the great mass of ancient sagas to which the scholar attaches much importance. Likewise those whose interests lie primarily in the ancient field are also anxious, usually for sentimental reasons, to further the cause of the modern language; but in no other manner is their work related to the present aspects of the question.

Why, then, this growing interest in the study of Celtic that has been quite noticeable in America during the past decade or so? In a recent annual report of the President of Johns Hopkins University, Professor Maurice Bloomfield, the eminent Sanskritist, emphasizes the "pressing need of more permanent and systematic instruction in research in Celtic." Whence comes this need for more adequate instruction in a subject whose importance is not obvious to the uninitiated, is a question that deserves an immediate answer. It behooves us therefore to explain at the outset the great value attached to Celtic from the philological, literary, or historical point of view.

In articles on *Modern Philology* in the New International Year-Book from 1910 on, the author of the present study has repeatedly called attention to the great productivity of Celtic scholars in the field of philology. Scarcely a year passes but some standard work makes its appearance. For the present at least the subject seems almost inexhaustible. This is not to be wondered at when we consider that there are six important Celtic languages, several of which contain an abundance of material for linguistic study. If we limit ourselves to the principal Celtic language, Irish, we are impressed at once by the fact that the monuments of its ancient language represent, to quote the words of Kuno Meyer, the "earliest voice from the dawn of West European civilization." We can trace its most interesting linguistic history from pre-Christian times through a vast array of inscriptions and documents down to the present day. We can witness at close hand the gradual disintegration of a highly inflected language, possessing originally a bewildering number of verb-forms, an extensive vocabulary and a complicated syntax, and understand how therefrom has emerged a comparatively simple modern tongue whose only defect, if such it may be called, consists of a traditional orthography that no longer has any application. Thus far, philologists have only touched upon the most general phases of the history of this remarkable language, no satisfactory attempt having been made to solve the great underlying problems. Even the line of demarcation between dialects, for the ancient periods at least, has not been distinctly or satisfactorily drawn. It will be necessary to wait until most of the available material can be brought together—and there is little hope that this can be accomplished in the immediate future—before any comprehensive studies of this nature may be essayed. And when this great work is completed much interesting light will no doubt be shed upon the life and growth of language in general. It is further worthy of note that at present when philological method, thanks to the insight of the brilliant Meillet, is undergoing a process of transformation which will probably mark a new and important era in its development, one of the members of the Celtic school, Professor Thurneysen, has been able to indicate with astonishing discernment from the knowledge gleaned from the history of the Irish language the path to be followed by scholars in the future.

But most students are attracted to the study of Celtic because of the wealth and importance of the literature of these peoples. It is needless to attempt in this brief study to emphasize the great influence exerted by the literary culture of the Celts upon that of

Western Europe. At least twice the note struck from the Celtic lyre has vibrated throughout modern literature. To most well-informed readers this is but to restate a trite truism, and is therefore beside our purpose. Few of us, on the other hand, are cognizant of the vast wealth of the ancient Irish literature. So great is its extent that the brilliant Irish scholar Eugene O'Curry once asserted that the contents of the strictly historical tales known to him would be sufficient to fill up four thousand of the large pages of the edition of the *Annals of the Four Masters.* He further computed that the tales about Finn, Ossian and the Fenians alone would fill another three thousand pages. Besides these, according to Dr. Douglas Hyde, "we have a considerable number of imaginative stories, neither historical nor Fenian, such as the *Three Sorrows of Story-Telling* and the like, sufficient to fill five thousand pages more, not to speak of the more recent novel-like productions of the later Irish." As for the value of this literature we can do no better than to quote the conclusions so well expressed by M. Darmesteter in his *English Studies.* According to the well-known French critic, "Ireland has the peculiar privilege of a history continuous from the earliest centuries of our era until the present day. She has preserved in the infinite wealth of her literature a complete and faithful picture of the ancient civilization of the Celts. Irish literature is therefore the key which opens the Celtic world."

Though poetry was cultivated to a very great extent in the latter part of the Old Irish period, it was by no means the chief mode of expression of the ancient Irish. On the contrary their literature was essentially one of prose. In this respect the Irish occupy a unique position among the nations of Western Europe; for, with the exception of Icelandic, theirs is the only literature whose earliest monuments—not even excluding the great national epic, the *Táin Bó Cuálgne,* or The Cattle Raid of Cooley—were not written in verse. While it is true that the masterpieces of the literature of ancient Iceland are also in prose, there is, however, very little doubt that in this as in many other respects the Vikings were indebted to the genius of the race they had conquered and whose libraries they visited with fire and sword. Notwithstanding the immense number of sagas preserved to us, we are obliged to admit that our knowledge of Irish literature would be far more extensive, had it not been for the incursions of these wild warriors of the North. An idea of the ravages of these marauders can be obtained from the results of the mission of M. d'Arbois de Jubainville, who was sent to the British Isles in 1881 by the French Government for the purpose of cataloguing all the Celtic manuscripts extant in the libraries of England and Ireland. It is not a little surprising to learn that "while the libraries of continental Europe possess twenty manuscripts written in the Gaelic language before the eleventh century, there are only seven of that remote age in the libraries of England and Ireland"; and this notwithstanding the fact that Ireland was famed for the wealth as well as the number of her libraries in the sixth and seventh centuries of our era. Fortunately for us, however, the ancient Irish transmitted a great part of their literature by the oral method, the foundation principle of the Druidical system of education. Many of these sagas were then committed to writing in the tenth and succeeding centuries in the famous collections known as the Book of the Dun Cow, the Book of Leinster, the Book of Ballymote, the Yellow Book of Lecain, and others.

The point of departure of this literature is found in the tales of the mythological cycle, which go back possibly several centuries before the beginning of the Christian Era; and thence there flows a steady, if varying, stream of literary productions of all sorts down almost to the present day. Many of these early sagas are written in a form of prose that in conciseness, picturesqueness, and vigor will compare favorably with that of any modern nation. To the Red Branch epoch belong the many accounts of the great feats of Cuchulainn, the national hero of Ulster, as well as the tragic story of Deirdre, the Irish Helen, whose fatal beauty led King Conchobar to commit an act of treachery so vile that his name was ever afterward covered with obloquy. Intensely human from every point of view, this immense saga literature gives us an accurate picture of social conditions in ancient Ireland. It is therefore of great importance not only as literature, but also as a panorama of the life of a primitive Indo-European race.

To the student of history, Celtic is again most useful. We need only mention Camille Jullian's great *Histoire de la Gaule,* yet in process of publication, in order to give an idea of what this field has in store for the historian. There are also two other important compilations relating to the ancient Celtic peoples that will no doubt prove of considerable value to historical research—the *Altceltischer Sprachschatz* of Alfred Holder, and the modestly entitled *Manuel d'Archéologie préhistorique celtique et gallo-romane* (also in process of publication) of Joseph Déchelette, the brilliant young Frenchman who fell in October, 1914, on the field of battle in Champagne.

D'Arbois de Jubainville and others have frequently pointed out that some four centuries B. C. practically all Western Europe was under Celtic domination. In the fifth and succeeding centuries of our era the influence of the Celt was again felt throughout the same section of the continent—this time not by force of arms, but by dint of superior intellectual training. It was then that the erudite Irish monks went forth to establish on the great pilgrimage routes to Rome and other places the monasteries which for centuries were famous as seats of learning. The distinguished German Zimmer has shown in a brilliant essay the far-reaching influence exerted by the Irish in that little known period. It was also during this time that the great collection, known as the *Brehon Laws,* was brought together. These Ancient Laws, as may be presumed, are of invaluable aid in reconstructing the culture of the early race. Their extent is such that in 1852 two indefatigable Irish scholars, O'Donovan and O'Curry, undertook to transcribe those volumes of the code that were still extant; and, in the words of Dr. Hyde, "before they died—which they did, unhappily, not long after they had begun this work—O'Donovan had transcribed 2,491 pages of text, of which he had accomplished a preliminary translation in twelve manuscript volumes, while his fellow laborer O'Curry had transcribed 2,906 pages more, and had accomplished a tentative translation of them which filled thirteen volumes." The completeness of these laws led Sir Samuel Ferguson to observe that they furnish "a striking example of the length to which moral and metaphysical refinements may be carried under rude social conditions." From Wales we have also the Laws of Howel Dda, a king of the early tenth century, which are of the greatest historical interest.

It is unnecessary to indicate further the reasons which have led, and will continue to lead, students to the study of Celtic. One might go yet further by pointing out the importance of Welsh literature and the numerous *points de rapport* between it and other literatures of Europe. But the limits of this paper forbid any further digression from the subject to be discussed.

The Celtic languages were among the last of the great Indo-European family to receive the serious attention of scholars. There are three important dates connected with the early history of this field of study. The first is 1853, the year in which the learned German Zeuss published his monumental *Grammatica Celtica,* by which he became the founder of Celtic philology. In spite of the great accomplishment of Zeuss, Celtic research continued to languish for several years, mainly for lack of a medium by means of which the results of scholars might be given to the world. This want was supplied by M. Henri Gaidoz, who founded in 1870 the *Revue celtique,* a quarterly periodical devoted exclusively to Celtic studies. Though the activity of Celtic scholars at once became apparent, no recognition was given by European universities to this field of research. To most of the men engaged in this work Celtic was almost wholly an avocation, inasmuch as they were occupants of chairs devoted to other subjects. Aware of this fact, the authorities of the Collège de France created in 1880 a chair in Celtic literature, the first to be established in any large institution of learning. The necessary stimulus having been given, progress in Celtic research has since been exceptionally rapid.

II. TEACHERS OF CELTIC IN THE UNITED STATES

In America the growth of interest in Celtic since 1900 has been marked. At that date there was only one large institution in the United States in which instruction in Celtic was offered; now this subject is taught in at least eight leading universities. The first attempt to give thoroughly scientific instruction in this field of study was made by Professor F. N. Robinson of Harvard University. Professor Robinson began the study of Celtic during the scholastic year 1895–96 under the direction of Professor Thurneysen of Freiburg. Afterward he continued private study, with very little formal instruction, in various parts of the British Isles. In Ireland he spent his time chiefly in copying manuscripts; in Wales he read the modern language with a local teacher and bard, and profited greatly by the general advice and direction of the late Sir John

Rhys and Professor J. Morris Jones. During one summer at Inverness in Scotland he enjoyed the great advantage of systematic work in Scottish Gaelic under the guidance of Dr. Alexander MacBain. Since 1896 Professor Robinson has taught Celtic uninterruptedly at Harvard. He offers Old Irish every year, and Middle Irish and Welsh in alternate years; and occasionally he has given courses in Modern Irish and Scottish Gaelic. In addition to the above courses he gives every second year, in collaboration with Professor Kittredge, a course in Germanic and Celtic religions. All this instruction has been taken almost exclusively by graduate students of advanced standing in philological work. While a few have taken up this subject in connection with general Indo-European grammar, the majority were specializing in mediaeval literature, whether Arthurian romances or Scandinavian. As for the number of students, Professor Robinson has had a maximum of eight, with an average of about three or four. His unflagging industry and profound scholarship have enabled this pioneer to exert through his pupils a powerful influence on the development of Celtic research in the United States.

Among the foremost of the pupils of Professor Robinson is Professor A. C. L. Brown, who began his academic career at the University of Wisconsin and afterward became head of the English department at Northwestern University. After finishing his courses at Harvard, Professor Brown continued his studies first at Paris under Gaidoz and d'Arbois de Jubainville, and later at Freiburg under Thurneysen. Though Professor Brown has given a course in the Old Irish language but once at Northwestern—during the scholastic year 1910–11 to a class of four students—he has lectured nearly every year on the relations between Irish, Welsh and other literatures to classes of some six or seven students.

While instructor in Romance philology at the Catholic University at Washington, Professor Joseph Dunn began the study of Modern Irish under Dr. Richard Henebry, at that time a member of the faculty of that institution. He went to Harvard in 1901 and followed for one year the courses of Professor Robinson. The following year he studied Old and Middle Irish and Breton under Thurneysen at Freiburg, and then moved to Rennes, where he heard J. Loth on Old Welsh and Breton, and Dottin on Modern

Irish Dialects and Irish Palaeography. Since that time he has spent three or four vacations in Ireland and Wales learning the spoken languages. From time to time Professor Dunn has offered courses in Old, Middle, and Modern Irish, Welsh, Breton, and Scottish Gaelic, as well as on the antiquities, religion, and folk-lore of the Celtic peoples, and the Celtic material in Old French literature. He has had students in all these subjects, the largest number in any one year being seventeen. The chief object of his course on Modern Irish is to give students a foundation for a reading and practical knowledge of the language.

Professor Tom Peete Cross also began the study of Celtic under Professor Robinson, and, as traveling fellow in Celtic and Comparative Literature from Harvard, continued his work at the School of Irish Learning at Dublin, where he specialized in Irish Palaeography under Professor Bergin. Afterward he returned to America and began his academic career at the University of North Carolina, passing thence to the University of Chicago. In the latter institution he offers two courses in Celtic: one on the general history of the literature, and the other on Old and Middle Irish. These two courses average six and two students respectively.

Since 1911 Miss Gertrude Schoepperle has offered courses on Celtic literature and civilization and on Old Irish in the University of Illinois. The former has proved a very successful course, containing at one time as many as twenty-two students, while in the latter the largest number registered has been three students. Professor Edward G. Cox, of the University of Washington at Seattle, offers courses in Modern Scottish Gaelic and Modern Irish. His classes number two and three students respectively. Celtic is also taught by Professor W. W. Lyman, Jr., at the University of California, and at Dalhousie University, Halifax, by the Rev. A. Maclean Sinclair. Recently Dr. Alexander Fraser of Toronto has sought to found a chair of Celtic in one of the universities of Ontario.

Celtic was first offered at Columbia in 1906. Since that time courses in Celtic Literature, Old and Middle Irish, Welsh, Breton, and Comparative Celtic Grammar have been elected with more or less regularity by graduate students. The largest number registered in any one course was ten in Old Irish. In Columbia, as in Harvard, Celtic has made its strongest appeal to students of mediaeval literature and comparative philology. Last year a course in elementary Old Irish for undergraduates in Barnard College was attended by thirteen students whose interests lay primarily in English or French. During the past two years Mr. M. A. O'Byrne has given conversational courses in elementary and advanced Modern Irish to evening classes under the auspices of the Department of Extension Teaching. The success of these courses was attested by the fact that the attendance in them last year was larger than in similar courses dealing with several of the most important of the modern European languages, such as Russian and German. It may be remarked in this regard that the Catholic University and Columbia are the only institutions in America which have thus far recognized Celtic to the extent of creating chairs in that field of scholarship.

III. Celtic Collections in Libraries of the United States

As the *point de départ* of interest in Celtic studies in the United States originated in Harvard University, it is fitting that we should consider first the Celtic collection in the library of that institution. In a general way it is estimated that this library possesses over three thousand volumes properly reckoned as Celtic. This includes the special collection of Celtic literature, numbering 840 titles, which was brought together last year. During the current year it has been largely increased by the addition of Welsh periodicals, principally those published in America. It contains also about a score of later Irish manuscripts, among them one valuable copy of the Tribal Book of the O'Byrnes. The Boston Public Library also possesses a collection of Celtic books of sufficient size to supplement the Harvard collection from time to time.

Among the other important collections in the Eastern part of the United States mention should be made of that of Cornell University, which received in 1874 by bequest of one of its professors, E. W. Evans, a number of books relating to Celtic. This nucleus has since been increased by purchases and gifts, and numbered 380 volumes in 1916. The Mercantile Library of Philadelphia has also a good collection of books on Irish literature, which amounted in 1912 to 1343 volumes. Though Celtic is not taught at Yale or

Princeton, the university library of the former contains 640 volumes dealing with Celtic languages and literatures, and the library of the latter has 168 volumes. The New York Public Library possesses 923 volumes properly classified as Celtic. If it were possible to enumerate all works dealing with this field that are now classified under other headings, the figure would probably be considerably enlarged. This collection comprises all the periodicals and learned reviews of importance, facsimile editions of the early Irish manuscripts, the Black Book of Carmarthen and the Hengwrt MSS. in Welsh, besides numerous rare and valuable works such as the publications of the Ossianic Society of Dublin, the Book of the Dean of Lismore, Alexander Cameron's *Reliquiae Celticae,* Kirke's version of the Psalms (1684), and the Book of Common Prayer in Manx (1610). Though it is beyond the scope of this paper to consider private collections, special mention should be made nevertheless of the extensive Welsh library of Mr. Henry Blackwell of New York, which exceeds 4500 volumes. Though practically complete from many points of view, this collection is especially rich in works relating to the history of the Welsh in the United States, bibliographies of Welsh literature, and local histories of Wales. There are somewhat less than 500 volumes classified under Celtic Languages and Literatures in the Library of Columbia University. To this rapidly growing collection, which was formed only a few years ago, there should be added about 150 volumes which, though dealing directly with this field, are classified for the present in other departments. The library of the Celtic Department of the Catholic University consists of about 2000 volumes, including the most important reviews and all the essential books for study and research, while the material at the Library of Congress, in the way of transactions of learned societies and works bearing more or less closely on Celtic, is invaluable.

The Library of Northwestern University contains several hundred titles on Celtic literature, including one or two very rare and useful books such as Potvin's edition of *Perceval.* Its resources are ample for the course reading of a class on the relations of Irish literature. The valuable collection of Celtic books in the Newberry Library at Chicago comprises complete sets of all the important periodicals, such as the publications of the Royal Irish Academy, the *Revue celtique,* etc., and facsimiles of all the old Celtic manuscripts that have been issued. The library of the University of Chicago has about 500 volumes on Celtic languages and literatures, besides a considerable number of books on related subjects, such as Celtic folklore, history, etc. For several years Professor R. T. Ely of the University of Wisconsin has been collecting books relating to Irish history and Irish economic conditions. He has secured the help of a number of prominent Irishmen in the state, and funds have been given for the purchase of books and pictures concerning Ireland. The collection is especially important for its works on Irish archaeology and architecture as well as Irish industries. It includes ten paintings by well-known Irish artists, such as George Russell (A.E.) and Jack Yeats. It should be noted that Professor A. C. L. Brown has materially aided in forming this collection. The University of Illinois has collected more than 1800 volumes and has recently spent $1500 for a collection of electrotype reproductions of Irish antiquities for its museum of European culture.

IV. Gaelic Societies

There are numerous Gaelic organizations in the United States, but unfortunately very few concern themselves with the history and literature of the Celtic peoples. The Gaelic League has for some years made a systematic effort throughout the country to give free instruction in the modern Irish language. In New York there was formed some years ago a Gaelic Literature Association, under whose auspices an Irish Historic Pageant was given in 1913; but this organization has since disbanded. In Boston there was several years ago a flourishing Philo-Celtic Society, whose meetings were occasionally addressed by Professor Robinson. More recently this has given way to a Gaelic school. Probably the most efficient organization of such nature is the Gaelic Society of Washington, D. C., which has been in existence nearly ten years and of which Professor Dunn is director. As far as is known, this is the only society of the kind in America which holds regular monthly meetings for the reading and discussion of papers on Celtic subjects and the rendition of Celtic music. The Society has had Welsh, Manx, Scottish, Breton, as well as Irish, evenings, and has had distinguished men of letters appear before it.

V. CONTRIBUTIONS OF AMERICAN SCHOLARS

Among the more important contributions to Celtic scholarship made by Americans are the *Irish Lives of Guy of Warwick and Bevis of Hampton* by Professor Robinson in the Celtische Zeitschrift (vol. vii). The same scholar wrote all the articles on Celtic Languages and Literatures in the first edition of the New International Encyclopedia, and has for a number of years contributed nearly all the Celtic reviews in the Nation and the American Historical Review. His scattered articles in learned publications have been mostly either Irish texts or studies in the history of ancient Celtic religion. His essay on *Satirists and Enchanters in Early Irish Literature* in the Studies in Religion in honor of C. H. Toy is substantial enough to deserve special mention. Professor A. C. L. Brown has made valuable contributions in his articles entitled *The Round Table before Wace* and *Iwain* in Studies and Notes, and *The Knight of the Lion* and *The Bleeding Lance* in the Publications of the Modern Language Association. Professor Dunn's most important works are *La Vie de Saint Patrice, mystère breton* (Paris, 1909); *The Ancient Irish Epic Tale, Táin Bó Cuálnge* (London, 1914), the best and most complete translation of the famous epic; *The Gaelophone Irish Conversations* (New Haven, 1910); and an anthology entitled *The Glories of Ireland* (Washington, 1914), besides some magazine articles. Professor Cross has written *The Celtic Origin of the Lay of Yonec* in the Revue Celtique (1910); *An Irish Folk-Tale* in the Journal of American Folk-Lore (1910); *Notes on the Chastity-Testing Horn and Mantle* (1913), *The Celtic Elements in the Lays of Lanval and Graelent* (1915), and *Laegaire MacCrimthann's Visit to Fairyland* (1916) in Modern Philology. He has in preparation a general discussion of the *Celtic Elements in Mediaeval Romance.* Miss Gertrude Schoepperle has written an excellent work in two volumes on *Tristan and Isolt* (Frankfurt, 1913), besides numerous articles in learned reviews which have received favorable mention in all quarters. Professor Cox contributed an edition of a text with glossary and notes, entitled *A Middle Irish Fragment of Bede,* to the Studies in honor of J. M. Hart (1910). He is at present working on a long text entitled *The Story of the Children of Israel.* The Rev. G. W. Hoey, a pupil of Professor Dunn, has edited *An Irish Homily on the Passion* (1911); and the Rev. J. A. Geary, also of the Catholic University, has issued a study entitled *Five Irish Homilies from the Rennes MS.*, and is preparing a doctoral dissertation on *The Verb "to be" with preposition in the Wurzburg Glosses.* Besides the above publications, mention should be made of the valuable contributions of Professors James Douglas Bruce, W. A. Nitze, and others. Mr. J. F. Kenney, a former graduate student of Columbia University, is preparing a doctoral dissertation on the *Sources of Irish History,* one of the most complete and scholarly dissertations ever presented in America. The author of the present study has contributed articles on *Blood-Feud, Ethics and Morals, Hospitality, Idols and Images,* and *Love and Love-Gods* to the Celtic section of the Hastings Encyclopaedia of Religions and Ethics, besides all the titles under Celtic Languages and Literatures in the second edition of the New International Encyclopaedia. In addition he has written various articles and reviews in learned publications, among them the first review of a Celtic work to appear in the American Journal of Philology. It is unnecessary to add that this brief bibliography does not include all the contributions to Celtic scholarship made in America; but it may suffice to give some idea of the activity of the present generation of Celticists.

VI. The Future of Celtic Studies

A word in conclusion as to the future of Celtic studies in the United States. That our universities feel a keen interest in this subject and realize its importance and value is evidenced by the words of Professor Bloomfield quoted above. There is little doubt that the introduction of Celtic into the graduate curriculum has been hampered largely by lack of scientifically prepared teachers as well as of funds. Likewise no pecuniary assistance has been offered to students in order to encourage them to engage in this field of study. The Catholic University has made a good beginning in this regard by the establishment of scholarships for research in Celtic. As for instruction in this subject, it seems probable, in the opinion of Professor Robinson, that in the future it will often be combined with work in other departments of scholarship. Celtic will doubtless remain a research subject, and not become a usual or important part of undergraduate discipline. Nevertheless a general course on the history and influence of Celtic literature might interest, to quote the same scholar, a considerable body of college students. But it cannot be denied that the number of Celticists is "vastly on the increase, and augurs well for the future of this department of knowledge." In an address delivered at Dublin a few years ago, Professor Kuno Meyer concluded a review of the present state of Celtic studies with the following significant remarks:

"I cannot conclude without casting a glance into the future. I am convinced that the present is but the beginning of an era of still greater activity in all departments of Celtic studies. Everything points to that.

"The more reliable text-books and hand-books published, the greater will be the numbers of those taking up Celtic studies. As the fields of other more ancient and more recognized studies become exhausted, there will come a rush of students on to the fresh and often almost virgin soil of Celtic research, to study the great Celtic civilization at its source, to collect the last lingering remnants of a mighty tradition.

"Again and again it has happened during recent years that workers in other subjects have in their researches finally been led on to the Celtic soil, where lie the roots of much mediaeval lore, of many institutions, of important phases of thought.

"And another thing, too, I will foretell. The re-discovery, as it were, of ancient Celtic literature will not only arouse abroad a greater interest in the Celtic nations, but it will lead to beneficial results among those nations themselves."

A casual glance at the bibliography of Celtic publications issued during the past ten years will serve to show that the prophecy of the distinguished German savant is fast becoming a fact.

John L. Gerig

ALIEN ESSENCES

"When men and women agree, it is only in their conclusions; their reasons are always different. So that while intellectual harmony between men and women is easily possible, its delightful and magic quality lies precisely in the fact that it does not arise from mutual understanding, but is a conspiracy of alien essences and a kissing, as it were, in the dark. As man's body differs from woman's in sex and strength, so his mind differs from hers in quality and function: they can co-operate, but can never fuse. The human race, in its intellectual life, is organised like the bees: the masculine soul is a worker, sexually atrophied, and essentially dedicated to impersonal and universal arts; the feminine is a queen, infinitely fertile, omnipresent in its brooding industry, but passive and abounding in intuitions without method and passions without justice. . . . There is something mysterious and oracular about a woman's mind which inspires a certain instinctive deference and puts it out of the question to judge what she says by masculine standards. She has a kind of sibylline intuition and the right to be irrationally *à propos.* There is a gallantry of the mind which pervades all conversation with a lady, as there is a natural courtesy towards children and mystics."

George Santayana, *The Life of Reason, Reason in Society,* pp. 148–149.

IF these words could be brought convincingly before a young man about to enter upon the task of teaching women, or before a community about to establish a liberal college for women, the project of neither would be very swiftly sped. Yet it is safe to say that they fairly represent what is still a widely prevailing attitude towards the mind of woman. That it is impossible to teach women anything rigorously intellectual, like logic or mathematics, is, for instance, the belief of the vast majority of those who have never taken the opportunity or felt the inclination to teach women anything at all. That there should nevertheless be women's colleges with male teachers, or with women teachers who have supposedly been taught by males, is one of the happy triumphs of popular inconsistency and the instinct for fair play. The triumph is rendered the more joyously bold by the fact that many of the men who thus illogically essay to teach women,—and young women at that,—are themselves young. For if there be any mind to which the youthful female intelligence is indeed unknown, if not alien, it is that of the average young man; and this is not less true when the young man is a Ph.D. The young instructor's intellectual commerce with young women has usually been obfuscated by the half-remembered dreams which Junior Prom romance causes to float about the silk-and-muslin form of the college girl; and it has been thwarted by the line of social caste drawn in most of our eastern universities with Hindu severity between men and women graduate students. The selection, therefore, of a young man to attempt what is generally supposed to be beyond all male powers displays an idealism the temerity of which is fortunately not realized by most college trustees. What is more important, the adventures of such a person, as he goes questing in the dark after the minds of young females, are profoundly representative of that larger enterprise which goes by the name of the liberal education of women.

At the very beginning, it must be noted, the perplexities of a young man attempting to teach women are not simplified by the fact that the presence of women in the academic shades is visibly embarrassing to many men and not least of all to many of the women themselves. In the labor of learning all workers are peers, and for one man to treat another accordingly is not difficult. How to treat a woman as both a lady and a peer, supposing for the moment that she does indeed qualify in the realm of mind, is not easy to decide. Academic men in this country have found it hard to treat female scholars as ladies, and yet neither as mothers, wives, servants, nor out-and-out intruders. So far as I know, for instance, nothing ever occurs at the "smoker" of any of our learned associations which the women members would not enjoy and with which they would consciously wish to interfere. Yet though peers may smoke, drink beer, eat thick sandwiches, sing, and otherwise make merry with one another, gentlemen are not in the habit of inviting ladies, unless it be their wives and then only as passive spectators, to share such entertainment. During the "smoker," therefore, the "ladies of the association," in the words of the official program, are frequently with delightful and exquisitely absurd propriety, invited to leave the premises and consort with the wives of their fellow-workers. Here is one of the ways of escape sought by the academic man when innocently cornered in his embarrassment by the academic woman. He is accustomed to wives, and he has a ceremonial of politeness with which to treat them when he feels that "something must be done for the ladies." Oppressed by a feeling of social obligation towards his feminine associates, he dodges his predicament by classifying them with the wives, a classification which they naturally resent. When you have measured swords or minds with a peer, you wish to strike hands with him, pledge healths, and celebrate the good fight with song and laughter. You do not wish to be asked to meet his wife, while he and half your comrades go elsewhere to wind up the tournament with rejoicing. A wife, under such circumstances, is most irrelevant; to be turned off upon one is a grievance, and to be classified socially as one after having been received as a peer seems an insult. But let us suppose for a moment that the ladies come to the "smoker" and behave like good fellows with the men. After the last bumper has been pledged, shall the peer who is a gentleman attend the peer who is a lady to her door? "Smokers" continue to a late hour; escort for the lady must be provided; but to squire her home from such a function is for both gentleman and lady as claret after beer; each experience, in itself delightful, is spoilt by the juxtaposition. Shall you then treat her as no lady whom you have treated as a peer and whom you would treat as a gentleman if she were a man? You would prefer to behave towards her without thought of sex, and therefore if you are conscientious, you sacrifice good-fellowship to manners; if not, you sacrifice manners without achieving good-fellowship. If she were only a servant, you would know how to act. You would not then be impelled to rise when she entered your office, to appear to listen deferentially when she spoke, to leap for the notebook which she spilled upon your class-room floor; you would not need, in other words, to give yourself concern for her which was not clearly defined for you and understood by her. But she is neither your wife nor your house-maid; she is that anomaly in academe as in the world, the woman whose status rests upon something neither sexual, social, nor personal.

One might multiply examples of such perplexities almost indefinitely; but enough has been said to show that, if the young instructor finds himself in the beginning somewhat at a loss to know how to behave towards his women students, his difficulty, though it may be rendered more painful by his age, is not peculiar to it. Yet this fact supplies no help or consolation. On the contrary, it means that he is further embarrassed by the witticisms and advice of friends and elders. First of all he has to suffer the smiles of comrades and classmates, who find it sufficiently amusing that he should teach at all, but excruciatingly absurd that he should teach girls. Then there are those who warn him to look to the color and repair of his socks; for the students, it is alleged, will stare at his ankles in order to put him out of countenance. But such brainless asininities, perpetrated to my knowledge constantly and with impunity by very charming and intelligent people, though they must be endured, need not be recounted. There are worse trials. It may be one's mischance, as it was mine, to tell a beloved and admired teacher of one's own that it has become one's duty to teach young women how to argue; and the guide, philosopher, and friend of one's youth may be unable to withhold the insufferably inevitable remark, accompanied by the usual simple-minded smirk, that the thing cannot be done. Or one may be exhorted—I draw again upon personal experience—never to call upon one's students at their homes, never to send them candy or flowers, and never under any circumstances to invite them to the theater or to dinner at the club. All such talk from dear friends will cause that inward melting away of the young man's spirit, or rising of his gorge, which is inspired by the old jokes of a father. Fortunately one can forgive much in friends as in fathers.

Yet we must not be betrayed into that facetiousness which seems always to attend the discussion of the education of women. There is a perturbation of the spirit real and serious in the young man who attempts to teach women. To face a class-room full of them, for the first or for the hundred and first time, is no laughing matter. The issue is clear-cut. One must decide on the spot whether to treat them as sexless workers or as queen bees, as potentially peers or as ladies who are also mystics; one must decide whether to meet them upon the plane of intellectual honesty or, as Mr. Santayana gracefully puts it, of intellectual gallantry. If the teacher takes the first of these alternatives, plainly he is, prejudice and theory both to the contrary notwithstanding, acting upon the assumption that women may become scholars. Now, that "the masculine soul is a worker, sexually atrophied, and essentially dedicated to impersonal and universal arts" may well be questioned if we include as masculine souls the sparks that animate those innumerable male clods whose labor, if it is not directed solely towards the satisfactions of sex, seeks at any rate no other satisfactions any more impersonal and universal. But certainly the soul of the scholar may be said, ideally speaking, to have sloughed off, not only the preoccupations of sex, but of family, country, and the rest of space and time, and to have given itself wholly to pursuits that transcend such limitations. Whatever the degree of scholarly weakness felt by any given teacher, when he attempts to teach he must, while using terms and an idiom intelligible to his pupils, nevertheless speak to them as though they possessed souls similar to his own. If the soul of woman, consequently, is an alien essence, without method or justice, vegetative, brooding, passive, intuitive, emotional, the scholar truly can find no language with which to speak to it; and woman must content herself, not only with never being a man, but also with never becoming a scholar. If this be the case, then the liberal college for women must indeed prove futile, unless, perchance, it should be possible in such an institution and without fundamentally altering its character to teach women to be, not scholars, but something else equally worthy.

What may this something else be? Mr. Santayana, like popular feeling in general, does not deny the possibility of intellectual harmony between men and women, but proclaims that it is only upon conclusions, not upon methods, that they agree. This, of course, is but the logical outcome of the argument that men and women cannot think together at all. Scholars, like all intelligent people, differ forever upon conclusions, but their methods are ideally the same. Their scholarly character is determined, whatever their achievement, not by the end at which they have arrived, but by the route and the procedure by which they advance. If, therefore, we must give up the hope of imparting method to women, evidently we must violate scholarly conscience and agree beforehand upon some absolute end at which they may be induced, not by reason, but, I suppose, by the hoary devices of coaxing, courtship, bargaining, and compulsion, to arrive simultaneously with us. This were indeed a "kissing in the dark"; and perhaps a scholar, being by nature a cautious man and under such circumstances conscious only that he kissed without knowing where or whom, might be chary of such meetings. If he imprudently embarks upon an adventure of this sort, he finds himself in the predicament of all those who would make teaching "vocational" rather than "liberal." When scholars try to agree upon particular and absolute ends, determining their methods accordingly, they are upon foreign ground. Never sure what should be done until they have thought, they must then go on teaching people to do a particular thing regardless of what they may come to think of that thing, and regardless of whether the people they teach can think upon any subject whatever. Now we may readily admit that there are occasions when something must be done and when no time remains for thought, and that when thinkers can foretell what actions may be desirable under particular circumstances, it may prove convenient to have individuals trained to perform those actions when the expected necessity arises. But the young man face to face with a college class-room of young women is precisely in the position where he can no longer think, but must do something. Those who would have him behave inconsistently with his previous thought must make plain to him how he should act in the emergency before him. If he is not to seek intellectual communion with his pupils and find his purpose in the give-and-take of mind, what shall he do? If he is not to assume that his pupils have minds which may play freely with his own in the sunshine regardless of particular eventualities, but must conspire to meet only when no one expects or sees, what is the young doctor's attitude towards the Misses Smith, Brown, Jones, and Robinson to be? In other words, what are the ends to which women as "alien essences" may by methods other than rational be led by men teachers in a liberal college?

The answer to this question is not vague. Modern society asks most of our women graduates to do one or both of two things,—either to get married or to teach school. If women are to be trained for any particular ends, these two are at present sure to be of largest importance. Yet when we ask how a young teacher of scholarly training in a liberal college may direct his teaching solely to either of these ends, we see the total absurdity of the notion that women have, in the so-called male sense of the word, no minds. Even in specialized institutions where such purposes are avowed, instruction, as it escapes into rationality, escapes from such particularity into the liberal, the thoughtful, the scholarly. Mr. Santayana tells us that our students are to be regarded as infinitely fertile, brooding, passive queens. Translated into the less fanciful language of popular feeling, this is to say that they are to be encouraged to be wives and mothers—a pretty task for the young Ph.D. The man may share the feeling that such should be the end of his teaching, but his previous thinking should have led him to perceive that the possibilities for the future of any human being are infinite, and his common sense warns him not to let the girls think that he expects or desires them all to get married and have children. Popular feeling, meanwhile, taking a practical turn, establishes schools where queen bees may be taught to do housework, or where young ladies may learn to become domestic ornaments for husbands who can afford to hire the childless unmarried and untutored to do the cooking. Liberal colleges may be transformed into such institutions only upon pain of violating fundamental principle. But, as I have indicated, and as Mr. Santayana neglects to observe, college women may not be called upon to function as queens; they may have to content themselves with being school-teachers, not to mention other roles which they as "sexless workers" may be called upon to fill. Again, however, let the young instructor openly assume that his women students are never to marry but are all to teach school, and once more he makes himself ridiculous and futile. Besides, as popular feeling has set up institutions for the inculcation of parlor accomplishments and domestic science, so the exigencies of the educational business have caused others to be established on the assumption, frequently and fortunately violated, that it is possible to show people how to perform the act of teaching without necessarily making sure of the ability of the teacher to think or of her knowledge of the subject she is to teach. It is not necessary to mention other particular ends for which women might be prepared in a college. If we ask what such ends are to be, marriage and teaching are in most cases the answer thrust upon us by the facts of the case, and enough has been said to show how impossible it is for a young man teaching women to assume that they are to be dealt with, not as though they had such minds as may be met in a college class-room, but only such as must be flirted with after dark if they are to be encountered at all.

Far different is the true state of affairs, as those who seek to know may learn. College women tolerate nothing in men teachers but that complete freedom and honesty of mind which is demanded of a scholar by his own conscience. The young instructor may not have his wits sufficiently about him at the start thoroughly to analyse the situation in which he finds himself; but as he meets the day-to-day emergencies that engross his attention, he finds that the determining factor in that situation is, in large measure, the mental attitude of the women themselves. There are those among them, to be sure, who will be silly after some feminine fashion of fretfulness, sentimentality, or sauciness, some who will weep or scold or fall in love with their professor; but student opinion in general is ruthless in its support of the teacher against such nonsense, which, if it be taken as nonsense, is negligible. The majority welcome only what would be welcomed by the majority in a similar audience of men. There is no greater need for deferring to sensibilities at the expense of truth, no greater need for bowdlerizing either literature or biology, no greater need of avoiding the abstract, the subtle, or the iconoclastic. To imagine a necessity for such inhibitions, to lose the impersonality of intelligence, is never to gain the respect of one's students. Young women have, of course, a different set of personal experiences to draw upon in meeting new situations with their minds; but I cannot discover that the meeting, when it occurs, as it does with a human average of frequency, differs in character from similar encounters achieved by men. When a woman in your class-room presents an argument which it takes all your masculine wit to criticise or refute, you find it difficult not to respect her intelligence. When she is illogical, or even "irrationally *à propos,*" you find it a stultification to your intellect to defer to her unreason on any ground whatever. What is more to the point, her fellow-women will not defer to her, and will show themselves to be sufficiently sportsmanlike to resent your giving any advantages in the game of mind because you are conscious that your opponents are women to be treated after the manner of children and mystics. They quickly perceive and resent any prepossession on the part of a man with notions of sex as between teacher and pupil. Let there be in his conduct the slightest trace of that romantic individualism which attaches undue importance to courtship at the expense of stabler and more satisfying relations in life, and that man's days in a woman's college will not long be happy. "Gallantry of the mind"—what is it after all but a pretty way of saying that for the moment the mind of a man will abdicate out of condescension to the unthinking, or that even an intelligent man is continually in that mood of chivalric amatoriousness which compels him to regard himself as potentially the loving knight of every female he converses with? He who teaches women is lost if his teaching is touched by such a feeling; and the most wholesome lesson to be learned by a young man in a woman's college is that women themselves, when they begin to think, do not long tolerate in a male teacher either mindlessness, condescension, or sentimentality.

Certain notions frequently to be met in academic circles bear out what has just been said. It is, for instance, commonly noted in this university that candidates for entrance to Barnard College pass better entrance examinations than do candidates for entrance to Columbia College, and weary examiners from the faculty of the latter institution are sometimes tempted to suppose that this means that our school-girls are developing better minds than our boys. The situation is too complex, however, to warrant any such conclusion. For one thing, the forces conspiring to deter unfit girls from going to college are probably somewhat more active than those operating against unfit boys. An even more prevalent notion is that women are more docile students, that they do their lessons more thoroughly and promptly than the men. Yet the longer one teaches women, the more one questions the truth of this notion; they lack no capability for being as recalcitrant, as superficial, as any male. The difference is merely in the terms of expression; their minds wear, as it were, different clothes, speak a different dialect.

Indocility in a woman, for instance, is not likely to look truculent, because truculence is seldom encouraged by anyone in girls as a virtue, as it is in any boy who ever had a fist-fight or even played ball on the corner. Superficiality, moreover, in a girl is frequently not disagreeable in its outward aspects; it is likely to disarm criticism and court deference by looking neat, sweet, and pretty. We may feel only compassion for the instructor who is taken in by it. When we are confronted, on the other hand, with the theory that girls work harder than boys, we have to remember that liberal education for women is still new enough to put many who seek it upon their mettle. The same phenomenon is to be observed in men's institutions where, among boys who come to college because it is the regularly accepted thing in their circles so to do, we meet also representatives of classes or races that have not yet formed the college habit. Such persons, regardless of sex, are more likely to work anxiously, under forced draught, in order to make sure of justifying themselves. In the case of women, there is the added handicap that our social customs have frequently impeded in them the development of a high degree of physical strength. In view of these considerations, therefore, we must not leap to the conclusion that women work harder than men because they more often work hard enough to make themselves ill. But there is a corollary to this notion that women are more industrious; and that is that they are correspondingly less likely to be brilliant, daring, creative, and original. The level of achievement is felt to be more even and perhaps higher among them, but there are supposedly fewer pinnacles, as there are fewer abysms. Upon this point it is difficult to formulate a conclusive opinion. All we can say is that women students in our colleges frequently do surprisingly brilliant and original things, as college students go, and that in well-conducted institutions the level of work among men is often surprisingly flat as well as high. Certainly it is true that, as the variety of careers open to men is greater and as the economic pressure upon them may be more insistent, they are likely to display more definite practical ambitions, which, while in some matters it may make them more alert, does not in every case conduce to an interest in scholarship.

There is only one conclusive thing, among those who have taught both sexes, about this whole discussion. There is no question, in spite of possible differences in quality of work, that men and women are able to work together without difficulty in intellectual things. There is no question that both must be met by the teacher with a freedom and honesty of mind that permits of no interference of sex.

If the teacher is taught by the female intelligence to think thus concerning it, his experience is but representative of the experience of society as a whole with liberal education for women. There is no universal solvent, no *deus ex machina*, for the solution of human problems except the human mind, and at least two problems have here been suggested for attacking which we may rely to our profit in part upon the minds of women. The embarrassment of the academic man confronted by the necessity of carrying on social relations with women out of their traditional sphere is but a phase, mild enough, perhaps, to be taken with some touch of pleasantry, of a serious problem that is wider than academe. Are we likely to gain much by assuming that women are not to be depended upon to give rational assistance in determining how we are to behave in all human relationships more rationally towards them, or must we forever be burdened by the necessity of doing their thinking for them as for children and mystics? Furthermore, is woman never to bring the mind of a sexless worker to bear upon the problems of wife and mother, or must we rely forever in the work she does for husband and children upon intuition, magic, and guess-work, however lucky these may sometimes appear? Finally, must we resort to such biological determinism as eugenics if we wish to improve the race, and never look for any growth of reason in mothers?

Here, of course, we verge upon deep and uncharted waters, where it is but too easy to take comfort in optimistic commonplace. There is nothing novel in these questions, nor in the answers here suggested for them. My purpose has been merely to record from experience some verification of the faith upon which liberal colleges for women have been established, above all to emphasize the fact that it is the women themselves who force upon men the attitude that a man must take in teaching them if he is to satisfy his own conscience. It is the women themselves who will stand no nonsense; and when one who has learned this lesson reads the words that I have put at the head of this article, he is not prevented by the brilliance of the style nor by the antiquity of the sentiments from perceiving what his students would think of the statements there made. Needless to say, we should feel no surprise at this repeated discovery that women have minds as well as instincts for brooding and for passion without justice or method. We should feel rather renewed confidence that nature, the nature of women as of men, is obstinate but not inductile, and that minds once met may be led and may lead.

WILLIAM HALLER

THE EDUCATION OF ENGINEERS*

I. The Historical Background

THE basis of the American system of education was laid by the general court of Massachusetts in two acts passed in 1642 and 1647, respectively. These state that the aim of education should be to secure four concrete ends of great value to the church

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* In 1907 the Society for the Promotion of Engineering Education appointed a committee to make a comprehensive study of the whole problem of engineering education. This committee, finding that it needed the help of practicing engineers, invited the national engineering societies to cooperate by appointing representatives to constitute with the original committee a joint committee on engineering education. The membership of this committee is as follows: Desmond FitzGerald (chairman), Onward Bates and Daniel W. Mead, of the American Society of Civil Engineers; Henry M. Howe and John Hays Hammond, of the American Institute of Mining Engineers; F. H. Clark and Fred J. Miller, of the American Society of Mechanical Engineers; Charles F. Scott and Samuel Sheldon, of the American Institute of Electrical Engineers; Clifford Richardson and Henry P. Talbot, of the American Chemical Society; J. R. Withrow, of the American Institute of Chemical Engineers; and C. L. Crandall, Dugald C. Jackson and Gardner C. Anthony, of the Society for the Promotion of Engineering Education.

This new committee soon discovered that the work required more time than any one member could devote to it. They therefore asked the Carnegie Foundation for the Advancement of Teaching to carry on this study with them as one of the researches of its Division of Educational Inquiry. In 1914 the committee and the Foundation selected as special investigator to make this study and report his findings to the committee Charles Riborg Mann, Associate Professor of Physics in the University of Chicago. Professor Mann, a graduate of Columbia College in 1890, received his master's degree from Columbia in 1891, and his doctor's degree from Berlin in 1895.

Meantime the *Report of Progress* printed here with the permission of the Carnegie Foundation suggests relations, and even principles, that reach beyond the training of engineers into vocational education in general. But its final significance, which claims even more general attention, is the unity of education, the idea that education in whatever field and with whatever specific relations, is the single enterprise of training the whole man. Editor.

The *Report* has also been separately reprinted from the *Bulletin of the Society for the Promotion of Engineering Education,* vol. vii, 1916, where it is introduced as follows:

"The chairman of this Committee and others have expressed their confidence that a great deal of good will come from this study. This seems probable and the commonwealth. These ends were, for the church, that every one must (1) learn to read the Scriptures and the catechism, and (2) have the free opportunity of entering the ministry through the grammar school and the college; for the commonwealth, that every citizen should learn (3) the capital laws of the colony, and (4) some gainful occupation.

At the time that this legislation was enacted the only occupations open to graduates of the college were those of minister, teacher and gentleman. The great majority of the people, including physicians and lawyers, learned their trades by the apprenticeship system. Therefore the responsibility for their education was divided between the schoolmaster and the master of apprentices. The schoolmaster was "to teach all such children as may resort to him to write and reade"; and be "able to instruct youth so farr as they may be fited for the university." The master of apprentices was to train them "in some honest lawful calling, labour or imployment, either in husbandry or some other trade profitable for themselves and the Commonwealth."

This division of the function of education between the schoolmasters and the masters of apprentices was inevitable under the social and industrial conditions prevalent in the colonies. In time, however, schools came to be regarded as constituting the whole educational system, and the fact that the training of every one to some "gainful occupation" is one of the important justifications of taxation for public education was forgotten. The magnificent service which the schools have rendered in conserving ideals in

for two reasons. One is that it is being guided by so able and so devoted a committee. The other is that the schools have welcomed the study and shown a hearty willingness to cooperate in every possible way. Under such conditions, how can anything but good result?

"Last year it was reported that the study was being carried on under four heads:

"First, a historical study, for the purpose of defining the meaning of the words 'American engineer.'

"Second, a study of the professional demand, to determine what it is that the professional engineer expects the school to achieve.

"Third, a study of the schools in detail, with an analysis of their work with reference to the demands of the engineering profession.

"Fourth, an investigation into objective methods of testing school work; of finding out whether men are competent to enter the engineering schools, and how effective the work is when measured by its results."

America is fully described in the standard histories of education. But the industries and mechanic arts, which have rendered a no less magnificent service in expressing American ideals and developing the American spirit, have received but scant recognition as essential elements of the national system of education. Since the industries and the mechanic arts have laid the material foundations of the United States and created the demand for engineers, it is not possible to understand engineering education without at least a brief sketch of the development of the demand that training in the practical arts be reinstated as one of the four essentials of a complete education.

The industrial history of America begins even before that of the schools. The first ship built by white men on this side of the Atlantic was launched in 1607 at the mouth of the Kennebec. A tannery was established at Lynn in 1629. In 1640 the General Court of Massachusetts directed the magistrates to consider "what course may be taken for teaching the boys and girls in all townes the spinning of yarn." By 1690 the American weavers of woolen cloth had become such successful rivals of the British weavers that Parliament passed the Woolens Act, which forbade the colonists from transporting woolen goods from one place to another for the purpose of sale.

"In 1718 a great stir was created in the town (Boston) by the arrival of a number of Irish spinners and weavers, bringing the implements of their craft. Directly the spinning craze took possession of the town; and the women, young and old, high and low, rich and poor, flocked into the spinning school which was set up on the common in the open air. Prizes were offered for the best work, and the enthusiasts went about proudly clothed in the homespun products of their own hands."

A special town meeting was held at the town house September 28, 1720, at which it was voted "that the Town will proceed to the choyce of a committee to consider about promoting of a Spinning School or schools for the instruction of the children of this town in Spinning." This committee recommended the erection of a suitable house and the employment of a weaver "having a wife that can instruct children in spinning flax, to take care of the school." This project was not carried out till 1753, when a wheel tax was levied, £1,500 raised, and the Manufactory House built for this purpose. In 1765 the Daughters of Liberty resolved to wear only homespun, and the seniors of Harvard College agreed to take their degrees (1768) "dressed altogether in the manufactures of this country."

It is a well-recognized fact that the efforts of the British to crush American manufacturing industries were among the chief causes of the Revolutionary War. The only positive action of the first continental congress (1774) was its non-importation agreement, aimed at establishing independence in productive industry. After the Peace of Paris, under the confederation, each colony controlled its own trade. Because there was thus no concerted action with regard to industrial protection, England was able to flood the American markets with foreign goods which were sold at prices with which home manufactures could not compete. American industry was paralyzed, money became scarce in America, and the working men were idle.

To meet this situation, associations of mechanics and tradesmen were organized in various parts of the country. These took an active part in the struggle for the ratification of the Constitution in the ardent hope that a federal government would be able to protect and encourage American manufactures. In this they were not disappointed, for the first act of the consolidated government (1789) was a statute for the joint purposes of "raising revenue and protecting manufactures by laying duties on goods, wares and merchandise imported." The first federal patent law was passed in 1790.

Not only were the manufacturers protected from foreign competition by the federal tariff, but they were also encouraged by financial aid from state legislatures. A bill levying taxes for the support of associations for the promotion of agriculture, manufactures and the useful arts was introduced into the Pennsylvania state legislature in 1798. Other states followed suit, but the first to vote funds for this purpose was New York. In 1819 an appropriation of $10,000 a year for two years was made. This state support led to the establishment of twenty-nine county societies for the promotion of agriculture and domestic manufactures during the two years.

This protection of American industry by the federal tariff and by state support seemed necessary at this time because the use of machinery and the factory system had progressed further abroad than it had in this country. In order to maintain this advantage, Parliament had forbidden the export of machinery to America. In 1788, however, Samuel Slater, a mechanic who had had experience with the British machines, escaped to America and built from memory similar machines here. Under his direction the first successful cotton mill driven by water power was established at Pawtucket in 1790.

The invention of the cotton gin by Eli Whitney in 1792, the application of steam power to navigation by John Fitch (1790) and Robert Fulton (1808), the development of machinery for threshing grain and milling flour by Oliver Evans (1791–1804), gave great impetus to these several industries, and domestic manufactures advanced by leaps and bounds.

Great difficulty was experienced in obtaining operatives, as the manufacturers were "required to raise up an entire new set of workmen from amongst our own Youth at a heavy expence." These operatives were poor children seven to twelve years old, whose parents had been able to give them small opportunities for schooling. Therefore, in 1793, Slater established at his own expense a "Sunday School" where these children were taught the three R's by students from Rhode Island College. These Sunday Schools were the precursors of the mechanics' institutes.

As the manufacturing industries developed and machinery came to be used more and more, the difficulty of securing skilled labor increased. Signs of exhaustion of the soil also began to make it evident that more intensive and scientific methods of farming must be introduced. In 1818 there was published in the *Gentleman's Magazine* the first account in English of the Fellenberg industrial school at Hofwyl, Switzerland. The Hofwyl school was first established as a charitable enterprise for the education of poor children. Its work was such a marked success that the children of the rich soon sought admission too. Its aim was the development of character by all-round training. Careful attention was given to physical health and to recreation by change of employment. Time was judiciously divided between books and the work of caring for the place. Sound morals were inculcated through good books, good environment, self-government, no prizes, and mutual confidence among instructors and students. The plan and methods of this school seemed so well suited to the needs of the situation in America that a similar school was established the next year by Josiah Holbrook at Derby, Connecticut.

This school was not a success; but the idea spread, and in 1823 the Committee on Agriculture of the New York Legislature made a report in which the establishment of a state school of agriculture was urged. The institution, to be modeled after the Fellenberg school, was to consist of: (1) a model farm, (2) an experimental farm, (3) a manufactory of implements of husbandry, (4) a school of industry and mechanic arts, (5) a boarding school, and (6) an institute of theoretical and practical agriculture. Arguments were adduced to show why such a school would benefit agriculture, commerce, manufactures, the morals of society, the revenues of the state, and politics.

This report closes with the remark, "The Hon. Stephen van Rensselaer has offered a gratuitious deed of the lands required for the use of the institution." The legislature failed to adopt the report, and the next year van Rensselaer proceeded to carry out the project alone and founded the Rensselaer Polytechnic Institute, the first engineering school in the United States. The methods of instruction introduced into this school by Amos Eaton, its first director, were original and somewhat different from those of the Fellenberg school. At this same time the public schools reached, according to the histories of education, the low-water mark of their efficiency.

The year 1824 witnessed the inauguration of another enterprise which has been of far reaching usefulness to technical education. Samuel V. Merrick inherited that year a machine shop in Philadelphia. He soon discovered that he could not manage it intelligently without some knowledge of machinery. Although the University of Pennsylvania had in 1816 "created a new department to be devoted to the study of natural science," and although five professors were still holding chairs in that department, Merrick was unable to get the kind of instruction he needed. He therefore decided to establish a new school. Professor Keating of the university department of applied chemistry joined in the venture. This combination of Merrick's need with Keating's knowledge proved effective. The Franklin Institute was established. One of its first students, a bricklayer named Thomas U. Walter, designed the dome of the Capitol at Washington.

From 1825 to 1860 the industries developed rapidly. Canals and railroads were built, the McCormick reaper, the sewing machine, and the telegraph were invented, and the Atlantic cables were laid. The west was settled, the federal finances prospered, and state school systems were developed. Every new stage of advancement in material prosperity and every new invention served to intensify the demand for greater knowledge of science and greater skill in the useful arts. This national demand had become so insistent by 1857 that it could no longer be ignored. The Morrill bill was introduced into Congress, and became a law in 1862.

It is important to note that this response to the national demand for practical knowledge came from the federal government. State school systems had been established by each state independently and on traditional lines; but this act calls for a new American type of school "to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life." It is also significant that the father of this land-grant college bill was father of the tariff act of 1861, and that bills increasing the federal bounties to these colleges were introduced into Congress during the tariff discussions in 1872, 1884 and 1890.

The decade from 1860 to 1870 witnessed the establishment of several of the most celebrated engineering schools. In following their subsequent development it is important to recognize clearly that their origin was very different from that of the schools of law and medicine. These latter were first established by practitioners as an outgrowth of the apprenticeship system, and were usually well developed as professional schools before they became affiliated with the colleges. The engineering schools, on the other hand, were not founded by engineers as the outgrowth of an apprenticeship system, but by college professors who sought to satisfy industrial needs by the methods to which they were accustomed in the colleges. Yet notwithstanding this close kinship of the engineering school to the arts college, the scientific school was kept distinct from the "college proper." The students preparing for an industrial profession were not considered as of the same caste with those preparing for the "learned professions."

This feeling in the colleges was reflected in the public schools, which were still oblivious of the fact that training for a "gainful occupation" is one of the four fundamental justifications of taxation for public education. The lowest depths of this oblivion were reached in the report of the Committee of Ten (1895) when languages, mathematics, history, natural history, physics, and chemistry were declared to be the only subjects "proper for secondary schools."

The achievements of engineering have, however, forced the recognition of the fact that knowledge of the practical arts is essential to the education of every American. The demand for vocational education is omnipresent, and the schools seem to be about ready to follow the lead of the engineering colleges in so teaching the mechanic arts that their educative power shall be felt by everyone. Since the apprenticeship system has now practically disappeared, this introduction of the industrial arts into school work is necessary before the schools can justly claim to give a complete education, *i. e.,* one that confers all the benefits on the church and commonwealth which the founders of the American educational system had in view.

For the past fifty years engineers have been absorbed in the work of inventing, constructing, and perfecting machinery and the material conveniences of life. A large field for usefulness along these lines will always remain open to them. But the methods of this work have now been standardized and reduced to a system. Every large plant has its designing department and even its research laboratory.

Relatively little attention has as yet been given to the scientific study of problems of the organization and control of the forces of men. These problems of human machine design and the conservation of human resources are as much engineering problems as are those of mechanism and the conservation of material resources.

The demand for creative work in this field of human engineering is daily becoming more insistent. Can the engineering schools longer afford to ignore it?

Again, American industry has developed in a land of abundant natural resources. It has always been protected by a tariff which has been raised as the industries grew stronger and more wealthy. This protected atmosphere of natural opulence has given strong incentive for the development of originality, initiative, and push. Every boy in America has felt that the opportunity to become president was open before him. There was, however, little incentive for economy of production. It was much easier to exploit the Indians or to persuade Congress to raise the tariff than it was to make a scientific study of production costs.

The increase in population and the waste of natural resources have now brought the United States under the operation of the law of diminishing returns. The problem of efficiency of production has been thrust upon us. This again is an engineering problem. It cannot be solved here by merely copying the autocratic methods that have been used successfully elsewhere, but demands an American solution which shall insure efficiency without sacrificing individual spontaneity and initiative.

These, then, are the three problems of the immediate future for the American engineer: (1) to introduce the practical arts into the schools in such a way that all may share their educational value, (2) to devise human machinery that shall assure to every American justice and a fair show, (3) to develop the highest efficiency of production, an efficiency which is attainable only when individual initiative is given the freest play.

II. THE PROFESSIONAL DEMAND

The returns from the circular letter sent out in the spring of 1915 were summarized and the results announced at the meeting of the American Society of Civil Engineers last January. Because of the rather unexpected nature of the summary and its importance in defining the work of the schools, the Joint Committee on Engineering Education last March sent to the members of the National Engineering Societies the following card:

Please prefix numbers to the groups of qualities listed below to show the order of importance that you give them in judging the reasons for engineering success or in sizing up young men for employment or promotion.

....Character, integrity, responsibility, resourcefulness, initiative.
....Judgment, common sense, scientific attitude, perspective.
....Efficiency, thoroughness, accuracy, industry.
....Understanding of men, executive ability.
....Knowledge of the fundamentals of engineering science.
....Technique of practice and of business.

Submitted by ....
Address ....
Years in practice ......

Up to June first, 6,773 of these cards had been returned; 352 were accompanied by letters explaining the views of the writers.

A statistical summary of the returns was begun on May first, when 6,069 cards had come in. Of these 5,441 were regular, each one rating the six groups in the order of importance by some single combination of the numbers 1–6. There were 489 irregular cards, in which one or more of the numbers appeared more than once, or in which the qualities were weighted by percentages instead of being numbered. On 139 cards the qualities were numbered in two or more different orders, one for engineering success, another for employment, etc. The regular cards were sorted according to the number of years in practice and the vote counted separately for

	Years in Practice				
	Under 10	10–19	Over 20	Not Given	Total
No. of ratings	1,000	2,000	1,941	500	5,441
$C > J$	84.8	86.6	88.3	88.2	87.0
$C > E$	92.5	92.8	92.5	91.8	92.5
$C > U$	92.7	93.0	95.0	95.8	93.9
$C > K$	91.8	91.9	91.0	91.4	91.5
$C > T$	97.3	98.0	98.0	98.0	97.9
$J > E$	77.8	78.7	76.3	75.4	77.4
$J > U$	80.8	82.1	84.1	82.0	82.5
$J > K$	78.4	79.7	74.7	75.8	77.4
$J > T$	96.8	96.2	95.0	96.2	95.9
$E > U$	59.7	61.5	68.5	65.4	64.0
$E > K$	65.0	63.0	64.9	64.4	64.2
$E > T$	93.9	92.9	92.7	95.8	93.4
$U > K$	57.7	57.3	54.5	52.2	55.9
$U > T$	89.9	87.1	85.7	86.0	87.0
$K > T$	92.3	90.3	90.7	91.2	90.9

each five-year period. Cards on which the years in practice were not given were counted together.

Differences in years of practice were found in make but little difference in the vote. The table at the foot of the preceding page gives the regular vote by ten-year periods. The table reads: Character was rated higher than judgment by 84.8 per cent. of the voters who had less than ten years of experience, by 86.6 per cent. of those with from ten to nineteen years of experience, etc. The last column gives the percentage vote on each item for all the 5,441 voters.

The most probable values of the relative importance of these groups of qualities have been computed from these percentage votes by the method described in Chapter VIII of Thorndike's "Theory of Mental and Social Measurements." These values are given in the first column of figures. The last column gives these same values as determined by the summary of the replies to the first circular letter explained in the *Engineering Record* for January 29 and the *Engineering News* for January 27, 1916.

Character	24.0		41.0	
Judgment	19.5		17.5	
Efficiency	16.5		14.5	
Understanding of men	15.0	75	14.0	87
Knowledge of fundamentals	15.0		7.0	
Technique	10.0	25	6.0	13
		100		100

Because of the constancy of the percentage of the votes, as shown in the table, it is clear that this statement of the factors essential to engineering success corresponds to a rather definite ideal in the professional mind. It is therefore safe to make use of this definition in testing and planning the work of the schools.

When applying this definition to the schools it is desirable not to forget several perfectly obvious facts. In the first place, all the qualities mentioned are essential to genuine success, and conscious effort should be made to develop all of them as far as is possible. Second, character, initiative, common sense, and qualities of this sort cannot be taught explicitly like multiplication tables and rules of grammar. Third, education is a continuous process of growth, and therefore the conscious development of the qualities of the first four groups cannot to advantage be arrested for four years, even for the sake of a mastery of knowledge and technic. Fourth, the man whose character, judgment, efficiency and understanding of men has developed most during his college years has the best show after graduation, since these qualities constitute 75 per cent. of his equipment. Fifth, the fact that character is rated at 24 per cent. does not mean that an engineer can succeed with a 24 per cent. character. It does mean that even a perfect character is but 24 per cent. of the engineer's total equipment.

With these facts in mind it is evident that instruction in mathematics or machine design which aims only at a mastery of fundamental principles and technic cannot be nearly as efficient as instruction which, while paying due regard to technic and the mastery of principles, yet develops integrity, initiative, resourcefulness, and common sense.

III. THE WORK OF THE SCHOOLS

A. What Freshmen Know and Can Do

Twenty-two schools have been visited and carefully studied. A composite picture of their work furnishes the best statement of conditions. Tests of 220 freshmen at four institutions have been conducted by Professor E. L. Thorndike. These tests furnish objectively certain facts about the human material which schools of engineering educate, showing what the members of the entering class know and can do. The following samples may serve to give some idea of their abilities.

In Algebra, nine tenths of the freshmen were able to solve the following equation: $x - 2a + b = 2x + 2b - 4a$. Only one third of them could solve the following: If $x = (a + b)/2$, what does

$$(x - a)^3/(x - b) - (x - 2a + b)/(x + a - 2b)$$

equal?

In Physics, nine tenths were able to tell what materials were needed to make an electric battery. Only one third could determine how much water must be added to a pint of alcohol 95 per cent. pure to make a solution of alcohol 40 per cent. pure.

Nine tenths were able to fill the blanks in the following: Light generally travels in . . . . lines. 100 Centigrade degrees equal . . . . Fahrenheit degrees. Only one third could correctly supply the missing words in: The mechanical advantage of a system of pulleys, provided no energy is dissipated inside the pulleys, is . . . . the number of . . . . of the cord supporting the load. When a mass of air is heated . . . ., its volume increases . . . . of its value at zero degrees for every rise of one degree C. in temperature.

English.—In English, nine tenths could classify as animal, flower, boy's name, book, something good or bad to be or do, the following words: zachary, dexterous, hyacinth, clematis, callous, mastodon, caribou, julian, ruthless.

Only one third could similarly classify: predatory, breviary, sophistical, campanula, pusillanimous.

Nine tenths could fill in "A body of . . . . . entirely surrounded by . . . . . is called an . . . . ."

Only one third were able to make sense out of "Let us briefly examine the social forces . . . . . at work concentrating or . . . . . . the ownership . . . . . . wealth."

Nine tenths could write the answers to the questions on the following paragraph:

"It may seem at first thought that every boy and girl who goes to school ought to do all the work that the teacher wishes done. But sometimes other duties prevent even the best boy or girl from doing so. If a boy's or girl's father died and he had to work afternoons and evenings to earn money to help his mother, such might be the case. A good girl might let her lessons go undone in order to help her mother by taking care of the baby."

1. What is it that might seem at first thought to be true, but really is false?

. . . .

2. What might be the effect of his father's death upon the way a boy spent his time?

3. Who is mentioned in the paragraph as the person who desires to have all lessons completely done?

Only one third could answer the questions on the following:

"A chief characteristic of science, then, is that in supplementing given facts it supplements them by adding other facts belonging to the same sphere, and eventually discoverable by tracing the given object in its own plane through its continuous transformations. Science expands speculatively, by the aid of merely instrumental hypotheses, objects given in perception until they compose a congruous, self-supporting world, all parts of which might be observed consecutively. What a scientific hypothesis interpolates among the given facts—the atomic structure of things, for instance—might come in time under the direct fire of attention, fixed more scrupulously, longer, or with better instruments upon those facts themselves. Otherwise the hypothesis that assumed that structure would be simply false, just as a hypothesis that the interior of the earth is full of molten fire would be false, if on inspection nothing were found there but solid rock. Science does not merely prolong a habit of inference: it verifies and solves the inference by reaching the fact inferred. The contrast with myth at this point is very interesting; for in myth the facts are themselves made vehicles, and knowledge is felt to terminate in an independent existence on a higher or deeper level than any immediate fact; and in this circumstance is what makes myth impossible to verify, and, except by laughter, to disprove."

1. According to the paragraph, what is the difference between the ether, the electrons or lines of electro-magnetic force and angels, a sun-god, or fairies, as principles of explanation?
2. According to the paragraph, by what sort of explanation of the facts of the world are the facts themselves made mere carriers of thought to conclusions in a realm outside that of such facts?
3. According to the paragraph, what are the methods and instruments by the aid of which perceived things and qualities are made the basis of a consistent independent universe?

B. What the Schools do to Freshmen

Two thousand freshmen of the type described entered a group of schools in the fall of 1911. Of these 732 graduated in June, 1915. The other 1,268 had been "weeded out."

The records of the 732 who graduated from the 14 different schools showed that 382, or 52.2 per cent., just "got by" in physics, 52 per cent. just passed in mechanics, 45 per cent. in calculus, 43.7 per cent. in modern languages, 43 per cent. in English, 34 per cent. in chemistry, and 23 per cent. in descriptive geometry. These averages for 14 schools do not differ materially from those presented last year for five schools.

There are many who maintain that these conditions are most encouraging; for the fact that only one sixth of those who enter graduate with credit proves that the schools are maintaining high standards. This position would be more readily understood by the critics of the schools, who constitute the great majority of the American public, if the term standards were more clearly defined. What sort of standards are being maintained by this process? Are they standards of scholarship, standards of academic culture, standards of engineering efficiency, standards of justice, of integrity, of morality, of common sense, of accuracy, of science, of art, of freedom of achievement, of worldly success, of unity, of service, of obedience, of duty, of law and order, of aristocracy, of democracy, or of humanity? Perhaps all of these and many more are meant. It would be a real service if the exact meaning of the phrase "maintaining standards" in schools might be accurately defined.

On the other hand those who consider that this high scholastic mortality and these high percentages of low grades are proofs of the inefficiency of the schools offer many hypotheses in support of their position. Among these, two are particularly suggestive. The first of these is derived by analogy from the experience of the industries with "soldiering." Under the old industrial system, workmen are paid according to the number of hours of work, and little attention is given to the amount accomplished per hour. Under this system the workman accomplishes as little as he dares, and unions are formed to raise the time rate and to standardize this minimum accomplishment. When the reward is measured solely by time and not by achievement, there is every incentive not only for laziness but even for deliberate deception of the employer as to how much can be accomplished per hour by a willing and properly instructed workman.

The school system is analogous to this old industrial system since it awards "credits" in accordance with Commissioner Finley's "table of academic weights and measures," namely:

45 minutes make 1 hour
5 hours make 1 week
36 weeks make 1 unit
15 units make 1 matriculant
120 semester-hours make 1 degree

The student who puts in the requisite time with an estimated efficiency of only 60 per cent. receives the same "credit" as one who achieves an efficiency of 100 per cent. The result is similar to that in the industries; many students "soldier," try to bluff their way through, and even unite to create the tradition that it is a disgrace to be rated much above the pass mark.

In the industries this situation has been met, first, by making a careful, detailed, scientific study of all the conditions that affect efficiency; second, by instructing the workmen in the best methods of work; and third, by making the reward depend on accomplishment. Where the old industrial system has been replaced by this new system, in accordance with the principles enunciated by Mr. F. W. Taylor, soldiering has disappeared, the workmen have doubled or even quadrupled their achievement, their earnings have increased, and they have become more contented and more healthy.

The success of this change of policy in industry makes us wonder whether an analogous change might not prove equally beneficial to the schools. Usually the method of presenting subject matter in schools is determined by the teacher's conception of logical rigor and theoretical unity. In spite of the fact that the high percentages of failure and low grades prove that this method is not effective, very few experiments have as yet been made to find methods better adapted to the abilities of the students. But if the same scientific care were used in setting tasks in schools as is used in setting tasks in industry, would not these conditions improve rapidly? And would not school grades be a truer measure of ability if tasks were graded from easy to difficult and credits were given, as is done in industry, only for those actually completed? Is it not probable that this system of awarding credit on the basis of achievement rather than on the basis of time would give to students a real incentive for real accomplishment, as it has to workmen?

Industrial managers not only spend hours and days of study in adapting the task to the workman; they take great pains to see that each worker is carefully instructed in the most efficient methods of doing his work. May it not be that more time could be spent to advantage in instructing students in the most efficient methods of doing their work, instead of leaving them to devise their own methods of study?

Thus the first hypothesis that is suggested to explain the high mortality and excessive percentages of low grades is that the method of awarding credit on the basis of time, of accepting a 60 per cent. standard of accomplishment, and of assigning tasks that are not adapted to his abilities gives the student no adequate incentive to achievement and encourages him in "soldiering" and in bluffing his way through.

Soldiering alone does not explain all the cases of failure and low grades. Many of those who are dropped from engineering schools should be dropped because they have no real inclination or ability for engineering work. A number of those dropped, however, persist in engineering work and succeed in spite of their academic shortcomings. Why are so many young men with pronounced engineering talent unable to make good in the engineering schools?

In one school some 74 per cent. of the graduates had had trouble in mechanics. The work of the class consisted in the solution of many problems—apparently an excellent plan. But the first problems of the course were these: Find the center of gravity of an equilateral triangle. Find the center of gravity of the area included between three sides of a square and the semicircle described on the fourth side as a diameter. Find the center of gravity of the area bounded by a given hyperbola, its asymptotes and given coördinates. No models were supplied.

The use of these strictly Archimedean problems was defended on the ground that the analytical processes involved in their solution were those needed the following term in the solution of problems in strength of girders. Yet 74 per cent. of these same students had trouble with this later course.

Why not give the real problems first? In the University of Washington, the course in mechanics, given by Professor C. C. More, is made up almost entirely of a series of real problems or projects of the grade usually found in such courses. This work was originally given in the third year because calculus was a prerequisite. The third-year men have, however, mastered it so readily that next year it will be given, calculus and all, to the freshmen. In like manner Professor Bird, of the University of Virginia, finds that laboratory problems very similar to those given in other schools to seniors in chemical engineering can be successfully mastered by freshmen. These examples define the second hypothesis that is suggested to explain the high percentages of failure and of low grades; namely, the work is not too hard, but it is presented in so abstract a manner that it has little or no meaning to the students.

If these hypotheses are correct, the problem before the schools is that of removing these two causes of failure. To do this, academic credit must be made to depend directly and objectively on achievement; and the work must be made more concrete.

This statement has been derived from an analysis of the work of the schools. Yet the problems which it defines are the same as those defined by the history of the engineering schools. For when the practical arts are introduced into the schools in such a way that all may share their educational value, the work becomes concrete and impelling to the student. And when academic credit is awarded on the basis of real achievement, efficiency and individual initiative increase together.

The solution of these problems will require much careful experimenting and study on the part of teachers; but as progress is made the schools will find that they are each year better able to meet the demands of the engineering profession. For character, judgment, efficiency, and an understanding of men, those personal qualities that make up 75 per cent. of the engineer's equipment, develop best in men who love their work and who labor with enthusiasm and intelligence at things which they know to be worth while.

CHARLES RIBORG MANN

THE SCHOOL OF PRACTICAL ARTS

FOUR years ago (1912) the University organized the School of Practical Arts of Teachers College, and placed its educational work in charge of a faculty formed by division of the Faculty of Teachers College into a Faculty of Education and a Faculty of Practical Arts. The new School became responsible for instruction in the technical and educational aspects of fine arts, household arts, industrial arts, music and speech, nursing and health, and physical education. In addition, instruction was provided in certain academic subjects that are important, and in many cases fundamental, for the work of the technical subjects named above.

The field of the School of Practical Arts was not at first clearly defined officially and is still unfamiliar to many members of other faculties of the University. There has long been a general understanding that practical arts include only household arts and industrial arts, and this impression has been supported by the fact that the departments dealing with these two lines are prominent parts of the School of Practical Arts. The School, however, stands for a very much broader conception of practical arts in education. The organization of the departments of the School has grown out of very liberal views of technical education, and practical arts have been made to include all instruction in subjects that involve a technic, or special methods in accomplishing work, in certain practical lines. Obviously, this applies to each of the six technical divisions of the School: Fine Arts, Household Arts, Industrial Arts, Music and Speech, Nursing and Health, and Physical Education. Each of these has its own technic so peculiar that there are rather sharp boundary lines between these several departments. However, a bond of union does exist in the fact that in all lines of practical arts the technical work is based on or guided by certain fundamental knowledge of the natural sciences and the aesthetic arts. As examples, physical education requires knowledge of applied biology (especially its hygienic applications), fine arts and music; household arts require chemistry, physics, applied biology, and fine arts; and industrial arts require natural sciences and the fine arts.

The work of the School is now arranged with reference to the needs of three groups of students: (1) four-year college students, (2) two-year (Junior and Senior) technical education students, and (3) graduate students who wish to specialize in either the technical or the educational aspects of practical arts.

The four-year college students are graduates of approved secondary schools and attracted to the School of Practical Arts by the many combinations of cultural and practical courses in four-year curricula leading to the Bachelor of Science degree, conferred by the University. These curricula include the equivalent of about one and one-half years of general cultural work (languages, history, hygiene, science, etc.), the same amount of technical work arranged with reference to some line of practical arts, and one year of elective courses in either general or technical lines. Four-year students who wish to prepare for teaching any phase of practical arts have their programs arranged for technical education (see below) in the Junior and Senior years. Students who bring satisfactory credentials from other institutions of collegiate rank are admitted to the four-year curricula with advanced standing.

The two-year technical education students come to the School of Practical Arts after having completed four years of high school and two years of approved study in colleges, normal schools, or technical schools. For such students the School offers two-year (Junior and Senior) programs in technical education which are arranged with special reference to preparation for the teaching of some phase of practical ats, such as fine arts, household arts, industrial arts, music, or physical education. The technical education programs in nursing and public health work are offered only for graduates of approved hospital training schools. On the satisfactory completion of any two-year major in technical education, the candidate receives from Columbia University the degree of Bachelor of Science, and also, if professional ability has been clearly demonstrated, a Teachers College diploma.

For graduate students in all the departments of the School of Practical Arts there are offered advanced technical and education courses arranged with reference to the needs of candidates for the higher degrees (A.M., M.S., Ph.D.) with major work in some line of practical arts. Such students may at the same time be candidates for Teachers College diplomas, and with few exceptions they are preparing for educational work.

A recent study of registration records has brought out the following facts regarding the distribution of students in the School. The total enrollment in 1915–1916 was 1194 matriculated students, of whom 1067 were undergraduates and 127 graduates. Of the undergraduates, 324 were in the Freshman-Sophomore group, and 743 in the Junior-Senior group. About three fourths of the latter group entered the School above the second year. More than 600 of the Junior-Senior group were preparing for teaching practical arts; but a small group planned to enter technical work, such as household administration, applied fine arts, and public health work. Still another small group looked upon their four years as having given a liberal education which they did not expect to apply vocationally. With regard to subjects of major interest, more than one half of the students of 1915–16 were in household arts, about one eighth in fine arts, almost as many in physical education, while industrial arts, music, and nursing and health combined had a total of about one eighth of the School's students. It should be noted, however, that household arts, fine arts, or physical education attract the majority of freshmen, while students of nursing and health and industrial arts are now admitted almost entirely above the Sophomore year.

The number of graduate students in Teachers College with major work in practical arts has increased from 37 to 127 in two years. The great majority of these students are interested in household arts, and with few exceptions they are candidates for the Master's degree and the Teachers College diplomas in teaching. The majority of these students are graduates of colleges which offer little or no undergraduate work in the practical arts, and hence such students must take in the School of Practical Arts certain elementary technical courses which are prerequisite to courses with graduate credit. As a result, the average graduate of the standard colleges for women devotes about one and a half years to completing the requirements for the Master's degree and the Teachers College diploma.

The School now offers for graduate credit the equivalent of

66½ full courses in technical and related educational courses as follows: Fine Arts 9½; Household Arts 26½; Industrial Arts 9; Music and Speech 6; Nursing and Health 7; Physical Education 8½.

It is a significant fact that the four-year program combining general cultural and practical courses is proving attractive to young women who recognize the value of practical arts as part of a liberal education without regard to professional or vocational application of the technic and special knowledge of the practical arts. Since the proper field for the School as a division of Teachers College is preparation of leaders in practical arts education, and since within five years of the organization of the School the building and equipment have become inadequate, it is not possible to offer definite encouragement to the type of student who is in search of a combined cultural and practical education without interest in professional application. In short, it is not possible for the School as at present organized and equipped to make any special attempt at curricula planned definitely for home life. It is true that but few students are now known to have no interest in possible professional application of their work in the School; but there are many indications that there would be a special demand for a non-professional college curriculum that offered a liberal combination of the old-line general cultural studies and the practical arts. This is not the province of a division of a college for the training of educational workers; but for the present it seems to be a justifiable phase of educational experiments in which Teachers College is logically interested. Perhaps standard colleges for women will see the opportunity for applying some of the results in this line that have come as by-products of our chief work of preparing educational leaders of practical arts. However, it is probable that practical arts cannot easily and successfully be grafted on the old-line college; for the experience of the School of Practical Arts indicates the importance to the students of working under a faculty in which even the language, history and science teachers have been selected because of their sympathetic interest in practical arts. Certainly this is a condition that is not now found in the teaching staff of the leading colleges for women.

M. A. BIGELOW

EDITORIAL COMMENT

The Real University

At the opening of the fall term Professor Seligman's address on The Real University stirred wide discussion. Appreciative newspaper comment, and even our own more extended analysis and quotation, should lead to the reading of the whole in the November number of the *Educational Review.* The distinctive object of the university, said the speaker in a preliminary logical exclusion, is not to diffuse knowledge, not to give professional training, not even to promote science, but to promote and to impart intellectual freedom. "The function of the state is to supplement the individual; the function of the church is to moralize the individual; the function of the university is to emancipate the individual. The state stands for order; the university for freedom. The church seeks for spiritual truth; the university for intellectual truth. The state stands for power, the church stands for unity, the university stands for independence. The state is the orderer, the church is the harmonizer, the university is the emancipator."

This penetrative formula was expanded to include the mastery of nature and of oneself, the development of the creative capacity, and the inculcation of courage in the struggle for political and social justice. "The old antinomies and shibboleths are thus largely fallacious. In lieu of the contrast between the scientific and the professional, the abstract and the concrete, the pure and the applied, the ideal and the utilitarian, the theoretical and the practical, we must put the new contrast between the progressive and the traditional, the adventurous and the routine-like, the creative and the receptive." Nor is there any real antithesis in the university between research and teaching. "Research may be found in the learned society or in the scientific institute; teaching can be carried on in the proprietary school. The university is neither the one nor the other, but by a reaction of research and teaching upon each other transforms both into a higher and unique compound, precious to instructor and student alike. For the former needs the enthusiastic and eager student to spur him on and to replenish his creative energy, while the latter needs the inspiration both of method and of personality. The true university is the one wherein, by this process of mutual reaction, intellectual freedom is promoted among the instructors and imparted to the students."

Therefore the university must be free not only from the political fanaticism and the economic antagonisms of the world without, but from undergraduate preoccupations within and, on the other hand, from "the menace of the unregenerate professional school." "The university spirit, therefore, demands with inexorable logic that every professor in the professional school should have made, and should be making, positive contributions to the subject which he professes. That he should be a good teacher, able to impart the correct method, goes without saying; but that he should possess the creative spirit is equally imperative. The true university should have no room in its law faculty for the so-called leading lawyer, in its medical school for the successful physician who is adding nothing to medical science, in its engineering or other professional school for the busy practitioner who is doing, perhaps a little better, what everyone else does. In the true university research is no less important in the professional schools than in the non-professional faculties. When the law school becomes also a real school of jurisprudence, when the medical school is regarded as the home of medical science, and when the other professional schools concern themselves with deepening and broadening the bases of their respective disciplines, then for the first time will the professional student realize what intellectual freedom means, then will the university no longer be menaced by unregenerate utilitarianism, then will the traditional opposition between the old faculties and the new disciplines fade away, then will every part of the institution be united by the same bond and animated by the same spirit. Then, in short, will emerge the real university."

For the students at a university intellectual freedom means simply self-reliance and independent achievement. For the faculties it is at once more important and more difficult. "If the true university is the embodiment of freedom, it goes without saying that the professors must be free: free to think, free to express their thoughts, free from crushing administrative duties, free from unduly long hours, free from financial embarrassment, free to elect their representatives, free to share in the choice of their successors or departmental colleagues. To be worthy of this freedom, however, is the indispensable correlative. The freedom to express their thoughts, especially in extramural utterances on hotly controverted questions of policy, must be tempered by the feeling that they can truly represent their institution only by bearing the torch of emancipation—emancipation from prejudiced thinking and from the extremes of comfortable obscurantism or callow radicallism; that they never can truly represent it by indulging in the cheap enthusiasms of intemperate partisanship."

"Freedom from administrative or scholastic duties must not be utilized as so much leisure to enter into more or less dubious outside lucrative pursuits, oblivious of their higher duties to the jealous mistress, science. Freedom from financial worry must not be employed for vegetation or for peaceful browsing on fields which ought to be their avocation. And finally, freedom to elect their successors must not be abused by the unworthy motives of nepotism, of social cliquism, of inbreeding, or of fear of being overshadowed. When those obligations are thoroughly realized, and not till then, will all the faculties be the embodiment of the real university."

The office of president, though a survival from the early American college, will probably remain useful through a rather long period of transition. Finally, "to the trustess is delegated, primarily, the financial responsibility for the university. And while we must not forget that the faculties of the mediaeval university attended successfully to all their financial concerns, it remains none the less true that the American trustees represent, in this respect, the activity of the government officials in Europe. Moreover, not to speak of the *Reformatores studii* in the Italian universities of the fourteenth and fifteenth centuries, we find boards of trustees in the newer continental institutions, scientific and professional, which are not yet incorporated into the universities or which are not under the immediate supervision of the government."

"We must indeed not forget that the trustees of the American universities are for the most part intelligent and hard-working supporters of the institution, whose devotion in many ways lightens the deliberative duties of the instructors. But if the trustees of what was formerly the small college are to remain in charge of the great university, they like the president, like the faculties, like the students, must learn, as they are fast learning, to represent the true university ideal. They must learn that the professors are not employés, that academic freedom must be unrestricted, that academic tenure must be permanent, and that in the rare cases when it may seem necessary to scrutinize the utterances or the actions of an instructor, not they, but his colleagues, within and perhaps without the particular university, form the only proper and safe body of investigation. They must learn to be on their guard against introducing into the university the methods or the spirit of the outside activities of which they are, perhaps, eminent exemplars. They must remember that in education, as in every vocation, even the practical view is best represented by the practitioner. They must learn to welcome the unofficial, nay even, as not a few institutions are now doing, the official and formal cooperation of faculty representatives in every question of university policy. They must learn to insist not alone on the obligations, but on the rights of the instructors, and must be prepared to defend them against the unfounded clamor of public sentiment and of private interest. In proportion as they will learn these truths, and will come to realize that they are trustees not merely for the material progress of the institution, but primarily for the perpetuation of the university ideal, just in that measure will they make themselves indispensable and beneficent."

"In social life nothing lasting has ever been achieved without whole-hearted cooperation. We all—trustees, president, faculties and students—must learn to emphasize our duties rather than our rights; only through a self-sacrificing readiness to perform our mutual obligations can we justly insist upon our privileges. The chief obligation that rests upon us all is recognition of, and devotion to, the true university ideal. Each one of us is in some respect in a position of authority toward others. Let us beware how we use this authority. Let us divest ourselves of the false notions that have grown up through tradition and perversion. Let us realize that in the true university we are all colleagues—teachers and students, deans and instructors, trustees and faculty; and that in a university there is no room for a sacerdotal hierarchy or an educational organization based on political or industrial efficiency. Let us remember that the spirit of the university is a subtle and elusive thing, all the more delicate and frail as it is pregnant of glorious potency. Let us preserve this spirit from the rough touch of blundering interference and of well meaning but clumsy manipulation. Let us keep alive the tiny spark which is even now visible, and let us endeavor, by careful tending and by unselfish and intelligent devotion, to fan it into the flame of the real university spirit which will take off the chill of educational ineptitude and which will illumine, for all time, the path of intellectual development and of permanent social progress."

Milestones in Medicine

Professor Longcope's historical review at the opening of the fall term of the School of Medicine began with an amusing reference. "Not long ago I came across an old pamphlet printed, as was stated, by desire in New York in the year 1769. It was entitled 'A medical discourse or an historical inquiry into the ancient and present state of medicine' by Peter Middleton, M.D., Professor of the Theory of Physic in King's College. Quaint as this discourse now appears, it derives its principal interest from the fact that it was the address delivered at the opening of the medical school in New York. According to his account, division of labor in the medical school at that time was a simple matter. The important subject of the theory of physic included both physiology and pathology, while voracious materia medica tried to digest both botany and what there was of chemistry. Referring to chemistry, he says, 'It is a study no less pleasing than advantageous to the physician and an amusement equally curious and entertaining to the gentleman and scholar.' His knowledge and admiration of the ancients were prodigious; but he freely confesses that 'all the progress made in the art of healing at or before the Flood may well be imagined to have been inconsiderable.'"

From Claude Bernard's distinction between observation as passive science and experimentation as active science, the speaker proceeded: "For centuries the only productive study was carried on by the inductive method, the objective study of disease; and during this period medicine as a descriptive science bears about the same relation to the medicine of to-day that botany does to pharmacology. Now it is evident that any achievement in science depends largely upon the method of investigation; and in the history of the world there is nothing more surprising than the tardy growth of that impulse of the human mind which leads men to subject natural phenomena to scientific experimentation." This distinction was then applied to the history of medicine from the Greeks, "artists, philosophers, and passive scientists," down to the seventeenth century. "The spirit of this century is everywhere apparent, and comes down to us no less in the work of Shakespeare, Velasquez and Rembrandt than in the study of natural phenomena. Investigation was directed towards botany, natural history, geology and particularly towards astronomy, mechanics and physics, and disclosed a wealth of information about the organic and inorganic world, reaching its highest achievement in the work of Newton upon the solar system. In medicine, still isolated from the other sciences, the study of the human body by means of dissection became common and was often made publicly, accompanied by music and plays. Anatomy as a descriptive science progressed with rapidity; and Malpighi, using the microscope recently invented by Loeweenhoek, found a world of new form and structure. Sydenham, the great clinician, following the example of Hippocrates and Rhazes, studied and described disease as he saw it, and as a consequence has left us pictures which are models of pure inductive study. Remarkable as were these advances in medicine and valuable as were their results, they still depended purely upon a passive science. The great achievement for medicine was made by Harvey in the discovery of the circulation of the blood. But the importance of this discovery reaches further than the new idea, revolutionary as it was; for Harvey, by introducing into medicine the method of experimentation, founded the science of physiology. Indeed, when one asks which has been of the greater benefit to medicine, the discovery of the fact or the introduction of this method of scientific experimentation, the answer must be unhesitatingly in favor of the latter.

"The effect which these advances had upon the following century is at first sight surprising. Men started to collect information as they might collect postage stamps. The foundation of systems and the development of encyclopedists took the place of research and experiment." This was the message of the whole address, that in science organization is but the reaping of the harvest; the vital force is individual research. Even the work of Linnaeus for botany, the foundation of museums, libraries, and scientific societies, the reformation of the teaching of medicine, did not compare in productivity with the researches of the eighteenth century in physics and chemistry.

"The brilliant young anatomist, Bichet, who is said to have lived in his dissecting room, and who died at thirty-one, looked deeper than the organs and made the tissues the basis for anatomy, thus preparing the road for modern biology. As a science biology really rests upon the development of the cell theory advanced in the thirties of the last century by Schleiden, a botanist, and Schwann, an anatomist and physiologist. With the application by Virchow of this theory to pathology a veritable new world was opened to medicine, soon to be impregnated through the marvellous investigations of Pasteur, Koch, and their many followers, with the living cause of this new pathology. Pasteur with one ingeniously planned experiment swept away the doctrine of spontaneous generation and not only showed how a seething mass of organisms brought death and destruction to mankind, but found a means to fight them." . . .

"Jenner through a single experiment established a principle in immunity. Once properly applied through a vast organization, for we can conceive of vaccination carried on throughout the world as such, smallpox, ubiquitous in the eighteenth century, has been practically eliminated. As another example one may mention typhoid fever, concerning which our knowledge, developed through a long series of carefully planned experiments, has reached the stage that makes it possible with money and men to eradicate the disease. Clean water supply, the detection and isolation of carriers, and prophylactic inoculation are the three necessities for carrying out this program. Of yellow fever, malaria, and beri-beri the same is true. Through such practical requirements there has grown the vast subject of hygiene, an applied science affecting on a large scale great communities of people requiring an enormous and efficient organization of trained workers in medicine, engineering, mechanics, physics and chemistry. Along these lines much has already been done. Panama, once a pest hole, is to-day a health resort for winter tourists. Havana, not long ago feared on account of its epidemics of yellow fever, has been converted into a city as clean and safe as Boston or New York. Certainly these accomplishments are splendid examples of organized effort. But in our admiration for the accomplished deed let us not forget Levaditi, Ross, Carroll, Lazaer and Reed. To these men, endowed with a vision of a peculiar type, using the correct experimental method, the lasting credit is due.

"Along another line too, that is in hospitals, organized effort is slowly making its way with the humanistic spirit, which was the incentive for their founding. These institutions are rapidly being converted in this country from charitable hostels, where patients once were made comfortable until they recovered or died, into institutions where not only the therapeusis of to-day, involving as it does the elaborate arrangements for surgery, drug therapy, sero-therapy, dietotherapy, electro- and mechano-therapy, and so on, can be successfully applied, but where accurate diagnosis of disease is possible and the future welfare of the patient watched and guarded. Indeed, such organizations are even being formed by private individuals, and through efforts of various men there is a definite movement to establish completely equipped central institutions, both in the large cities and in country districts, where private physicians may care for their patients and from which details of the health of the community may be managed. Such movements are not confined to the medical profession; for Moore, the English chemist, and such writers as Bernard Shaw and Wells, who have the ear of the public, have advocated a still more socialistic plan and wish to place such organizations in the hands of the state.

"Such rapid changes as have come within the last thirty years have naturally necessitated readjustments in medical teaching, and even today the faculties of medical schools spend many weary hours upon their problems of reorganization. And even in the prosecution of research there is not only an effort to cooperate, but a distinct tendency to organize the individual effort, in hopes that by so doing it may become most effective. The inestimable value and the immediate necessity of all this organized effort, which grows apace and rivets our attention, is obvious. But the most brilliant success can only be of contemporaneous worth. It serves a splendid purpose in solving a problem of practical importance and while doing so often unearths new problems. But in itself it is not a fundamental advance. The practical Romans drained the campagna; but that did not advance the knowledge of malaria. True it is that the universal effort to stamp out leprosy in the middle ages effected after hundreds of years almost completely its purpose; and in our age the problem of tuberculosis, which is somewhat comparable, may also be solved by the same method. But think what a difference it would make if through the expenditure of even a fraction of the vast sum that is required to effect this end even one mind could be developed that would see the way towards bacteriological cure or, better still, prevention of the disease. Here lies the real advance. Throughout the world's history great institutions and concerted movements have come, served their purpose, and gone. During this time the secrets of nature, whether animate or inanimate, so cunningly hidden, have been sought for by all conceivable methods, least successfully when too elaborate systematization has imposed formalism and servility upon man and the workings of his mind, more successfully during the individualistic periods, and most successfully since the recent advance of experimental science.

"Throughout the development of medicine it is apparent that real progress, lasting progress, has come only from individual effort expended in scientific investigation, whether this be purely inductive, as was the method of Hippocrates, or experimental, as was the method of Harvey and Pasteur. The milestones of medicine, as of all the sciences, are marked by men's names, not by the actions of committees, of senates, or of nations. These may retard or help progress, but they never initiate it. It is upon the individual working silently for years, unhampered, free of thought, usually unappreciated, that we must depend for the idea, the jewel upon which the wheel will turn. If once he finds this stone and shows how to apply it, for in medicine especially knowledge must be serviceable to be of value, a whole army of workers are called into action, and then it is that efficient and well directed organized effort does wonders."

The Intercollegiate Bureau of Occupations

Perhaps the most accurate and significant single record of current opportunities for women college graduates outside of teaching is the Intercollegiate Bureau of Occupations at 130 East 22d Street, New York, which has given to the *Quarterly* the following summary:

"A comparison with the labor market during the past summer shows that the Bureau's work has accurately reflected general conditions. Employers seeking workers have far outnumbered candidates seeking work; 507 persons registered, and 659 positions were referred to the Bureau, including the figures of the Department for Social Workers. The actual discrepancy was even greater than the figures indicate, because most of the positions must be filled at once with trained people, whereas many of the registrants were untrained and wanted work in the future. By the way, we have just coined the word *registrant* to avoid using the word applicant, which especially among social workers has an unpleasant implication. The number of placements during the four months ending October 1st was 258 in the Central Office and 83 in the Department for Social Workers. In the Central Office the successful placements were nearly 60 per cent. more than in the corresponding months of last year.

"Among the unusual opportunities for secretaries were one with the president of a mining company, two others with a conservatory of music and an opera company, several in the political headquarters and suffrage organizations, due to the stress of their respective campaigns, one with a psychologist and neurologist, one with a physician whose specialty is psycho-therapy, and one with a French professor who required a native-born French woman as an expert stenographer. Perhaps the most notable achievement was the sending of a graduate of Syracuse University to a secretarial position in a school in Honolulu. In the course of the negotiations the Bureau had a cable address recorded for future use.

"In our Department for Social Workers 67 positions were filled during the three months ending August 31st: 53 for women, and 14 for men. Among the women placed was a nurse for a large manufacturing plant in Arizona, a policewoman for a city in Iowa to look after court cases, several agents for the women's relief organization which cares for national guardsmen's families in New York City, a field worker to make the psychological and genealogical studies in a large State reformatory for girls, and a head-resident for two settlements in Colorado.

"Among the miscellaneous positions were one for a woman with journalistic experience to read and summarize two thousand news clippings daily, an advertising writer with a department store, two assistants for efficiency experts, a dietitian in a large sanatorium in the South, a matron for a State university in the far west, several assistants in cafeterias, four employees in a telephone company, and an editor of a domestic science column in a New York daily."

"The Bureau has recently decided to eliminate from its placement work certain types of positions which are relatively unimportant and which consume a disproportionate amount of time. Hereafter we shall not place tutors, governesses, or mother's helpers in resident positions in families. We shall also discriminate against those types of clerical work which seem to offer no value as training or which are temporary or casual. Hereafter no positions offering less than twelve dollars a week will be registered unless they may be considered apprentice positions and offer a good professional future. Our rules for registrants will also be modified in accordance with the demands made in certain professions for a higher grade of candidates. For example, those applying for dietitians' positions and librarians' positions must be either college graduates or trained in an approved technical school. In other words, we shall no longer register those who have had extended experience in these two fields, but who have not had the technical training offered by the best institutions. These changes are in accordance with our general policy of studying each field of work and the conditions controlling the supply of candidates."

A Single Degree for Columbia College

The annual report of the Dean of Columbia College, always of more than local significance, is this year so widely important in its review as to claim extensive quotation.

"The problems most difficult of solution which face Columbia College are those incident upon its continued and rapid growth in numbers. That of continuing to care for each student as an individual, which has been referred to in previous reports, has led to the appointment of four Assistants to the Dean, Messrs. Siceloff, Nelson, Fansler and Moon. These gentlemen will act as expert advisers to students looking forward to professional study in Engineering, Medicine, Business, and Law. Thanks to the further provision in the Budget for 1916–1917 for additional instructors, it will also be possible for another year at least to keep the separate classes and sections from growing in size beyond the limitations of effective teaching.

"On the other hand, the question of physical accommodations has, for the first time since the opening of Hamilton Hall, become really acute. Next year we shall have to reclaim the quarters now occupied in that building by the College Entrance Examination Board, and even with this additional space the College classes can only just be squeezed into the class rooms at the disposal of the Registrar in Hamilton and elsewhere. For this and other reasons it is not unlikely that certain classes, or rather sections of classes, will soon have to be advanced to the hour of 8–9 a. m.

"Another difficulty, less obvious but not less real, is that of private office accommodations, preferably in Hamilton, but certainly somewhere, for the increasing staff. This is a question of twofold importance for the College. Much of our most important teaching is done, not in the class room, but to individual boys in the teacher's study. An instructor, furthermore, who does not grow with his chosen subject soon loses his usefulness to the College. Now, unless a man has private means, he must keep his books and do his scholarly work in his office, for the simple reason that he cannot afford to rent an apartment with an additional room for the purpose. We have long since passed the stage where an instructor may count upon a room to himself, and if the crowding together has to be carried much further it will be a serious matter. At present the pressure bears very unevenly, owing to the fact that some departments have increased more rapidly than others in staff. I should suggest that the question of office assignment throughout the University might well be made a special study by the proper authorities.

"In 1905 the Faculty prescribed for all College students the completion of two sequences of study, and provided further that the choice as to the sequences to be selected should be conditioned by the degree for which the student was a candidate (*i. e.,* A.B. or B.S.). At that time probably no one foresaw that this limitation would prove a decade later to be the chief factor in a decision to confer a single degree at Columbia as evidence of the completion of any approved course of collegiate study. Other factors also had their weight in the decision reached by the College Faculty on February 21, 1916; but the underlying reason was the demonstration from a knowledge of specific cases that in any institution where the individual interests and needs of students are recognized as entitled to consideration, limitations of choice based upon the fact that two or more collegiate degrees are offered becomes inevitably an artificial restriction upon the serious student. It is of interest in this connection to note that the most recent fundamental change in the educational regulations of the French Ministry of Public Instruction provides a single Baccalaureate degree for all classes of students.

"For purpose of record, the report of the Faculty to the University Council with regard to the adoption of a single degree is submitted herewith.

THE DEGREE OF BACHELOR OF ARTS IN COLUMBIA COLLEGE

At the stated meeting of the Executive Committee of the University Council, April 11, 1916, the following report and recommendations were concurred in by the Executive Committee, with the exception that in the opinion of the Committee, Section 2 of the Resolutions of the Faculty of Columbia College, as here contained, should be amended by striking out all after the word 'English.' In this form the report and recommendations were ordered to be transmitted to the Council for action:

From its foundation in 1754 until 1882, Columbia College conferred but one degree, that of Bachelor of Arts. Between 1882 and 1889, the degrees of L.H.B. and B.S. were conferred upon a few students, and in 1906 the B.S. was again awarded and has since then been conferred upon those students of the College who have not completed the stated requirements in either Latin or Greek. The corresponding special requirements for these students have been for entrance, Physics and Chemistry, plus two units of intermediate or advanced subjects, and the completion of an 18 point sequence in mathematics or a laboratory subject. In other words, under the present regulations a candidate for a college degree must choose between offering either a total of five years' study of Latin (the number offering Greek without Latin has been negligible) on the one hand; or on the other, at least two years' work in science for entrance, plus three years' college work either in mathematics or in some single laboratory science.

As was pointed out in the report of the Dean of the College in 1914, the major intellectual interest of a large and increasing number of students has been in neither of these fields, the statistics of the students' choice of electives for the year 1913–14 being as follows:

Classics	77
English and Modern Languages	785
History, Economics, and Politics	571
Laboratory Sciences	410
Mathematics	167
Philosophy and allied subjects	410
Miscellaneous	94

For the many students whose chief interest is in English or a modern language or in the Political Science group, the present requirement that a very considerable portion of time in school and college should be devoted to the satisfaction of one or the other of the requirements stated above has been an onerous one and, in the opinion of the Committee on Instruction, has been without educational justification. It has doubtless deterred many desirable students from entering Columbia College, or having entered, from remaining to graduate. The operation of the regulation results in the imposition of a large number of technical entrance conditions, which have greatly added to the burden of the admissions office. Full fifty per cent. of the conditions now standing against the records of students are in Latin, Chemistry or Physics.

The need for greater elasticity in the technical machinery of the College has been rendered still more acute by the fact that, for the future, the School of Architecture, the School of Business and—if the resolutions now under consideration are adopted—the School of Journalism also, are to be based normally upon two years' work in college. For the majority of students who wish to secure the necessary preliminary training in Columbia College before taking up work in one of these schools and to take advantage of the Columbia policy of the combined course, the present requirements impose conditions which would seem to the Committee to be unnecessarily burdensome and complicated.

After consideration of ways and means to remedy these difficulties, the Committee resolved to recommend the award of the single degree of Bachelor of Arts, rather than the retention of the B.S. with the establishment of a third collegiate degree, and for the following reasons:

In the first place, a return to a single collegiate degree would be in accord with the historic policy of Columbia College. Secondly, the multiplication of baccalaureate degrees has reached absurd proportions, no fewer than forty-three such degrees being now conferred by chartered institutions in the United States. The announced policy of the Trustees is definitely opposed to such multiplication within Columbia University. Thirdly, the degree of B.S. does not stand for any particular type of training at Columbia. It is conferred by Teachers College for work in education and the various branches of practical arts; it may be conferred upon students of the College of Pharmacy; and it has just been authorized for students of Medicine and Business, without reference to collegiate residence at Columbia. Even if, within the College, the B.S. degree could be limited to students whose major interest is in Science (which is not the case at present) it has lost whatever significance it may have possessed as a collegiate degree at Columbia.

As a result of these considerations, the Committee, on December 20, presented to the Faculty a recommendation that the College return to its original policy of conferring a single degree, and formulated certain recommendations designed to bring this about with the fewest possible changes consistent with the maintenance of the present high standards for admission and graduation. The general proposal and the specific recommendations have been thoroughly discussed at two informal meetings of the entire College staff and at two stated meetings of the Faculty. At the second of these latter, held on February 21, the subjoined resolutions were adopted upon the recommendation of the Committee on Instruction.

Under the provisions of the Statutes [Ch. III, § 23], resolutions adopted by any faculty which involve a change in the educational policy of the University with respect to the requirements of admission or the conditions of graduation shall be submitted to the University Council before being recommended to the Trustees. Since the new regulations regarding the Schools of Architecture, Business, and Medicine will go into effect upon July 1, 1916, it seems most desirable that the resolutions adopted by the College Faculty should be made effective, if approved, at the same time, in order that the College may be in a position to carry on its work without embarrassment next fall. For this reason the resolutions are, at the suggestion of the President, referred herewith to the Executive Committee of the Council in order that they may have the consideration of that Committee in advance of the April meeting of the Council, and it is hoped, may be recommended by the Committee to the Council for approval at that meeting.

"One of the effects of the new legislation will be to give greater freedom in the junior and senior years to those students whose formal training will end with College graduation. In city universities like Columbia such students are not in the majority, almost two-thirds of our graduates continuing in professional or other advanced study here or elsewhere. Their number is sufficiently large to warrant careful study, however; in each Freshman class there are probably one hundred such men. The Committee on Instruction has been directed by the Faculty to investigate and report upon the needs and opportunities of this group of students. . . .

"The most important fact in the life of Columbia College is its membership in Columbia University. Assuming, and I think the assumption has been proved to be a fair one, that the College maintains its individuality in the midst of the complex life of this great institution, the advantages which a student of real ability and intellectual interests can enjoy are inestimable. In former reports, I have tried to show different aspects of the inter-relationship between the College and the University. During the year just closed, two new factors have been introduced by University legislation. After 1918 the College will furnish two years of preliminary training for the professional courses in Journalism instead of one, as at present, and a similar minimum of college preparation has been prescribed for entrance to the newly established School of Business. This will bring the College into close and, it is hoped, mutually helpful relations with the two youngest members of the University family. Recent changes in the regulations at Teachers College have, in effect, restored to our seniors the privilege of taking a professional option in Education.

"It may be of interest at this time to show in some detail the importance of the College as a 'feeder' for the University Faculties of Political Science, Philosophy, and Pure Sciences.

"In the following table the first figure represents the total number of the higher degrees granted to men and the second figure the number of those who are graduates of Columbia College. (The A.M. figures for 1915–1916 do not include Teachers College.)

	1900–1901		1905–1906		1910–1911		1911–1912		1913–1914		1915–1916	
A.M.	78	16	125	12	181	19	228	30	280	41	216	26
Ph.D.	24	3	37	5	72	7	66	6	51	4	67	12

"Since the first award of a Columbia degree with honors, in 1911, thirteen of fifty-five honors graduates have received higher degrees, and nineteen have been awarded appointments as scholars and fellows. One of our recent honors men will be the new Rhodes Scholar at Oxford University from New York State. . . ."

Frank Dempster Sherman

Every one who enjoys the delicate art of Sherman's verse, or has felt the stimulus of his personality, will look forward to the appreciation promised for the next issue of the QUARTERLY by his friend and fellow poet Clinton Scollard. That distinction of personality which in Sherman's publications enhanced the fame of Columbia was felt on the campus in a certain rare flavor of conversation and individuality of opinion. That he brought to the teaching of architecture poetry as well as mathematics added to those personal values which in a true estimate constitute a university.

The report of the President, received as we go to press, contains the following passages of commanding importance.

The Annual Report of the President

"The present situation of the University is accurately revealed by the fact that the Treasurer's Report for the year ending June 30, 1916, shows a deficit of $40,855.14 and that the Budget adopted for year ending June 30, 1917, shows an estimated deficit for that year of $92,661.95. This means that the normal income of the University falls far short of meeting the necessary cost of work now established and in progress. Even if that work were in all respects adequately supported and equipped, and even if the compensation of academic officers were in all respects satisfactory, it would still be impossible for the University to take any important forward step without large additions to its productive funds. These facts explain why it is that the important and well-matured projects which the University has it in mind to carry out are all held in abeyance through lack of means. When, in the Annual Report for 1902, the statement was made that $10,000,000 were urgently needed by Columbia University, and it was shown in detail how so large a sum could be promptly and effectively employed, the amount was thought to be unprecedently large. In the interval since 1902 so much has taken place, and so many new and useful avenues of academic activity have opened, that it is within the mark to say that the sum of $30,000,000 must still be added to the resources of Columbia University if it is, within a reasonable time, to accomplish satisfactorily the tasks that are now laid upon it.

"Of these, the most important and the most pressing is that of going forward, in coöperation with the Presbyterian Hospital, to carry out the plans for a medical center and for developing graduate instruction and research in medicine and surgery on a scale at least equal to that found anywhere else in the world. For this project alone, the sum of $12,000,000 will be needed if the plan, adequately endowed, is to be carried out in all its fullness of detail, including the diagnostic clinic so clearly described in the report of the Dean of the Medical Faculty. . . .

"Next in importance to the project for a medical center and a graduate school of medicine and surgery come the plans of the Faculty of Applied Science for industrial and engineering research and for the articulation of the work of the research laboratories with the needs and interests of the nation's industries. The European war has served at least one good purpose in arousing our industrial managers and our public men from their long sleep of indifference to scientific inquiry and to scientific progress. It has now been heavily borne in upon them that what some American industries waste would support a principality under wiser and keener administration. The future of American industry is bound up with the future of American science. The Schools of Mines, Engineering, and Chemistry, already distinguished in high degree and now upon that advanced plane which invites only the highest type of student and releases time and energy for genuine research, are anxious and ready to undertake with great energy some of those specific tasks which will aid American industry to improve its products, to decrease its wastage, to coördinate its processes, and to multiply its resources for dealing satisfactorily with the many-sided human problems which industrial relationships and industrial enterprise of necessity involve. The testing and experimental laboratories which are needed in such an undertaking must be placed at the point where transportation, both by rail and by water, is easy and cheap, and where there may be ready access not only on the part of those who conduct the investigations and those who are being trained in methods of research, but also on the part of those who represent or are engaged in the industries whose problems are, at any given moment, the subject of inquiry. It is within the mark to say that a capital sum of $6,000,000 for equipment and endowment is needed in order to deal promptly and satisfactorily with this great group of problems. Every dollar put into such an enterprise would be returned to American industry many times over in the course of a very few years.

"The same spirit of inquiry and advance which has within recent years made over the work of the Schools of Medicine and of Mines, Engineering, and Chemistry is also at work in those subjects which fall under the jurisdiction of the Faculty of Law. The specific requirements of the practitioner at the bar have in the past been the one dominant influence in shaping the program of study in law and in guiding the activities of the professors of law. These specific requirements are, of course, fundamental, and the school of law which did not begin by giving a sound and practical training to men who were to become members of the bar would be in a sorry plight indeed. But law, too, is a living subject. Its history, its comparative development in this and other lands, its interdependence with purely political and with purely economic movements and influences, its slow but certain development under the pressure of new needs and new ideals, are all matters which invite vigorous inquiry and fresh exposition. Public law has been fortunate in that it has received this stimulating treatment for a generation. The time has now come when the same spirit must take possession of the field of private law and when a truly university school of law will always be a school of jurisprudence as well. Nothing is gained in substituting a big word for a little one, unless the substitution implies the entering of a new spirit. A school of jurisprudence might well be nothing more than a big name for a poor school of law. It can be saved from this fate, however, by being built upon the foundation of a first-rate school of law and by then devoting itself, in scientific fashion and by scientific method, to the examination and interpretation of questions in the history of the law and in its present state which suggest themselves as suitable topics for inquiry and public presentation. The cost of building up a body of investigators in the field of law is not nearly so great, for obvious reasons, as is the case in medicine or in engineering. What will be needed in this case is a group of capable men and the material with which they may work. An endowment of $1,000,000 for legal research and inquiry, would probably suffice for some time to come.

"In the general fields of political science, philosophy, and pure science the spirit of research is in full command of the University forces. The need here is for increasing the equipment and material for research, and, in some cases at least, of adding to the staff men who are particularly competent or promising in certain definite parts of the field of knowledge. It is difficult to say what might be a fair estimate of the cost of making these new provisions. A capital sum of $2,000,000, however, would certainly enable the University to take long strides forward without delay. . . .

"The very striking increases in the salaries of academic officers that have been made at Columbia during the past ten years have greatly relieved a situation which was at one time deplorable. Nevertheless, the steady rise in the cost of living and the increasing rewards to be had in gainful occupations make it necessary to consider constantly ways and means of increasing the compensation of at least two classes of academic officers. The first class consists of those exceptionally eminent and distinguished men who have come to full middle age and are now part of the pride and glory of the intellectual life of the people of the United States. It is surely suitable that the University should be able to give to such men a compensation that would in some slight way measure the regard and esteem in which their personality and service are held. The second class consists of those young men who, in setting foot upon the lower rungs of the academic ladder, are constantly tempted by business opportunities that offer three or four times the compensation which they can hope for at the moment if they accept an academic career. It is important to the future of American scholarship that such young men should be numerous, for it is from them that a selection must be made of those who are to hold the high places in the academic life of the generation to come. . . . There is no more reason why all academic officers who have the same title should receive the same compensation than there is why all men of the same height or the same complexion should be paid the same wage. The man of experience and of either teaching power or genius for investigation should be advanced, both in compensation and in grade, as rapidly as possible and without any regard to the fate of others who are without his talent or capacity. Only in this way can a university be kept the home of excellence and prevented from becoming an asylum of mediocrities. . . .

"These problems and these needs are the stuff of which a university's life and a university's business are made up. If the University was truly described in 1902 as a giant in bonds, then in 1916 it is a whole company of giants bound hand and foot by financial impotence. This is the situation with which the Trustees are day by day confronted, and it will remain to confront them, in one form or another, until the time when their capital funds are increased by about $30,000,000.

"The simple fact is that Columbia University is under-capitalized. If it is possible for a great industrial enterprise to procure all the capital it needs when the return is but twenty, or ten, or even five per cent., why should a university be held back from accomplishment, through lack of sufficient capital, when the returns are everlasting and are to be measured in terms of human life, human satisfaction, and human achievement?"